

637332

REPORT NUMBER 214-GTL-04-001

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 214S
SIDE IMPACT PROTECTION (STATIC)**

**NISSAN MOTOR CO., LTD.
2004 NISSAN MAXIMA, PASSENGER CAR
NHTSA NO. C45207**

**GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443**



SEPTEMBER 9, 2004

FINAL REPORT

PREPARED FOR

**U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-220)
WASHINGTON, D.C. 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: Debbie Messick
Approved by: [Signature]
Approval Date: 9/9/04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted by: [Signature]
Acceptance Date: 9-17-04

1. Report No. 214-GTL-04-001	2. Government Accession No. N/A	3. Recipient's Catalog No. N/A
4. Title and Subtitle Final Report of FMVSS 214 Compliance Testing of 2004 NISSAN MAXIMA, PASSENGER CAR NHTSA No. C45207	5. Report Date September 9, 2004	6. Performing Organ. Code GTL
	8. Performing Organ. Rep# GTL-DOT-04-214-001	
7. Author(s) Grant Farrand, Project Engineer Debbie Messick, Project Manager	9. Performing Organization Name and Address General Testing Laboratories, Inc. 1623 Leedstown Road Colonial Beach, Va 22443	10. Work Unit No. (TRAIS) N/A
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Admin. Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 7 th Street, S.W., Room 6111 Washington, DC 20590	11. Contract or Grant No. DTNH22-01-C-11025	13. Type of Report and Period Covered Final Test Report August 30, 2004
	14. Sponsoring Agency Code NVS-221	
15. Supplementary Notes		
16. Abstract Compliance tests were conducted on the subject 2004 Nissan Maxima Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214S-05 for the determination of FMVSS 214 compliance. Test failures identified were as follows: NONE		
17. Key Words Compliance Testing Safety Engineering FMVSS 214	18. Distribution Statement Copies of this report are available from NHTSA Technical Information Services (TIS) PL-403 (NPO-405) 400 Seventh Street S.W. Washington, DC 20590 Telephone No. (202) 366-2588	
19. Security Classif. (of this report) UNCLASSIFIED	21. No. of Pages 56	22. Price
20. Security Classif. (of this page) UNCLASSIFIED		

TABLE OF CONTENTS

SECTION		PAGE
1	Introduction	1
2	Test Procedure and Summary of Results	2
3	Compliance Test Data	4
4	Test Equipment List	10
5	Photographs	11
	5.1 Front View of Vehicle Pre-test	
	5.2 Left Side View of Vehicle Pre-test	
	5.3 Right Side View of Vehicle Pre-test	
	5.4 Rear View of Vehicle Pre-test	
	5.5 3/4 Frontal View from Left Side of Vehicle Pre-test	
	5.6 3/4 Rear View from Right Side of Vehicle Pre-test	
	5.7 Vehicle's Certification Label	
	5.8 Vehicle Tire Information Label	
	5.9 Vehicle VIN Plate	
	5.10 Instrumentation Setup	
	5.11 Rear Vehicle Tie Down - Test 1	
	5.12 Front Vehicle Tie Down - Test 1	
	5.13 Inclinator Pre-Test 1	
	5.14 Dial Indicator Pre-Test 1	
	5.15 Load Device against Door - Pre-Test 1	
	5.16 Load Device against Door @ max load - Test 1	
	5.17 Inclinator at Max Load - Test 1	
	5.18 Dial Indicator at Max Load - Test 1	
	5.19 Post Test Door Outside - Test 1	
	5.20 Post Test Door Inside - Test 1	
	5.21 Rear Vehicle Tie Down - Test 2	
	5.22 Front Vehicle Tie Down - Test 2	
	5.23 Inclinator Pre-Test 2	
	5.24 Dial Indicator Pre-Test 2	
	5.25 Load Device against Door - Pre-Test 2	
	5.26 Load Device against Door @ max load - Test 2	
	5.27 Inclinator at Max Load - Test 2	
	5.28 Dial Indicator at Max Load - Test 2	
	5.29 Post Test Door Outside - Test 2	
	5.30 Post Test Door Inside - Test 2	
	5.31 Front View of Vehicle Post Test	
	5.32 Left Side View of Vehicle Post Test	
	5.33 Right Side View of Vehicle Post Test	
	5.34 Rear View of Vehicle Post Test	
	5.35 3/4 Frontal View from Left Side of Vehicle Post Test	
	5.36 3/4 Rear View from Right Side of Vehicle Post Test	
6	Test Data Plots	48

SECTION 1 INTRODUCTION

1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Nissan Maxima 4-door passenger car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 214 testing to determine if the vehicle was in compliance with the requirements of the standard. FMVSS No. 214 establishes requirements for the side doors of a Motor Vehicle to minimize the safety hazard caused by intrusion into the passenger compartment as a result of a side impact accident.

1.1 TEST VEHICLE

The test vehicle was a 2004 Nissan Maxima 4-door passenger car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1N4BA41E94C854759

B. NHTSA No.: C45207

C. Manufacturer: NISSAN MOTOR CO., LTD.

D. Manufacture Date: 09/03

The vehicle's front and rear seating systems were removed for this test. All vehicle windows were closed and all doors were locked for this test.

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 214 testing on August 30, 2004.

SECTION 2 TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 TEST PROCEDURE

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-214S-05 dated 14 September 1993 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-214S-05, "Static – Side Impact Protection".

Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, 2.1 or 2.2 when any of its side doors that can be used for occupant egress are tested.

2.1 OPTION ONE

With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of 2.1.1 through 2.1.3.

2.1.1 INITIAL CRUSH RESISTANCE

The initial crush resistance shall not be less than 2,250 pounds.

2.1.2 INTERMEDIATE CRUSH RESISTANCE

The intermediate crush resistance shall not be less than 3,500 pounds.

2.1.3 PEAK CRUSH RESISTANCE

The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

2.2 OPTION TWO

With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of 2.2.1 through 2.2.3.

2.2.1 INITIAL CRUSH RESISTANCE

The initial crush resistance shall not be less than 2,250 pounds.

2.2.2 INTERMEDIATE CRUSH RESISTANCE

The intermediate crush resistance shall not be less than 4,375 pounds.

SECTION 2 CONTINUED

2.2.3 PEAK CRUSH RESISTANCE

The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.

SECTION 3
COMPLIANCE TEST DATA

DATA SHEET 1
TEST VEHICLE RECEIVING-INSPECTION

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
 VEH. NHTSA NO.: C45207 ; VIN: 1N4BA41E94C854759
 VEH. BUILD DATE: 09/03 ; TEST DATE: AUGUST 30, 2004
 TEST LABORATORY: GENERAL TESTING LABS
 OBSERVERS: G. FARRAND, J. LATANE

A. First compliance test by laboratory for this vehicle is the static FMVSS 214 test.

 Yes X No (Go to item 2)

 X (1) Label test vehicle with NHTSA Number

 X (2) Verify all options on the "window sticker" are present on the vehicle

 X (3) Verify tires and wheel rims are new and the same as listed

 X (4) Verify there are no dents or other interior or exterior flaws

 X (5) Verify the glove box contains an owner's manual, warranty document, consumer information, and extra keys

 X (6) Verify the vehicle is equipped with the proper fuel filler cap

 X (7) If the vehicle has been delivered from the dealer, verify the vehicle has been properly prepared and is in running condition

B. Verify seat adjusters are working

 X Yes No

C. Verify there is a seat belt at each seating position

 X Yes No

D. Without disturbing the integrity of each seat belt and anchorage, verify that each seat belt is attached to the anchorage. For seat belts that are attached to the seat, also verify the seats are attached to the seat anchors and the seat anchors are attached to the vehicle.

 X Yes No

E. Curb Weight of Vehicle: 3482 LBS.

F. COMMENTS: (Explain any problems here)

RECORDED BY: 

DATE: 08/27/04

APPROVED BY: 

DATA SHEET 2
PRETEST PREPARATION

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
 VEH. NHTSA NO.: C45207 ; VIN: 1N4BA41E94C854759
 VEH. BUILD DATE: 09/03 ; TEST DATE: AUGUST 30, 2004
 TEST LABORATORY: GENERAL TESTING LABS
 OBSERVERS: G. FARRAND, J. LATANE

Prior to testing the following will be accomplished:

	<u>TEST</u>
	1 2
A. Check the manufacturers certification statement to determine if the vehicle should be tested with or without seats installed.	<u>X</u> <u>X</u>
B. Remove all seats unless the vehicle has been certified with the seats installed. If the seats remain in the vehicle, they are to be adjusted per the COTR's instructions.	<u>X</u> <u>X</u>
C. Close all windows	<u>X</u> <u>X</u>
D. Lock All doors	<u>X</u> <u>X</u>
E. State door tested	<u>LF</u> <u>RR</u>
F. State the length of a horizontal line drawn on door through a point 5 inches vertically above lowest point of test door	<u>44.4</u> <u>30.6</u>
G. State vertical distance from the lowest part of test door to bottom of loading device	<u>5"</u> <u>5"</u>
H. State position of vertical centerline of loading device on the midpoint of line determined step F	<u>22.2</u> <u>15.3</u>
I. Determine that the vertical axis of the loading device is perpendicular to the longitudinal and lateral axis of the test vehicle	<u>X</u> <u>X</u>
J. Determine that the top of the loading device is above the door window opening but not touching any structure above the window opening	<u>X</u> <u>X</u>

RECORDED BY: *G. Farrand*

DATE: 08/30/04

APPROVED BY: *D. Messitt*

DATA SHEET 3
STATIC LOAD TEST - BACK-UP SYSTEM DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
 VEH. NHTSA NO.: C45207 ; VIN: 1N4BA41E94C854759
 VEH. BUILD DATE: 09/03 ; TEST DATE: AUGUST 30, 2004
 TEST LABORATORY: GENERAL TESTING LABS
 OBSERVERS: G. FARRAND, J. LATANE

RESULTS: Plots of load versus displacement and time versus displacement obtained from the back-up data (attach plots to data sheet) showed that:

TEST #1 - GTL #5242 (LEFT FRONT DOOR)

- A. The initial crush resistance was 3139 lbs.
 B. The intermediate crush resistance was 5039 lbs.
 C. The peak crush resistance was 8647 lbs at 12.661 inches
 D. The rate of loading was .2"/sec

The dial indicator and the inclinometer showed the following deflections.

LOADING DEVICE TRAVEL	DIAL INDICATOR	INCLINOMETER
0 inches	<u>0.0000</u>	<u>0</u>
2 inches	<u>.0289</u>	<u>0</u>
4 inches	<u>0.0785</u>	<u>0</u>
6 inches	<u>0.1450</u>	<u>0</u>
12 inches	<u>0.4260</u>	<u>0</u>
<u>12.661</u> Inches (full travel)	<u>0.5186</u>	<u>0</u>

TEST #2 - GTL #5243 (RIGHT REAR DOOR)

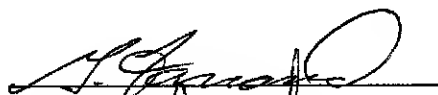
- A. The initial crush resistance was 3426 lbs.
 B. The intermediate crush resistance was 5738 lbs.
 C. The peak crush resistance was 11,108 lbs at 12.467 inches
 D. The rate of loading was .2"/sec

DATA SHEET 3 CONTINUED
STATIC LOAD TEST - BACK-UP SYSTEM DATA

The dial indicator and the inclinometer showed the following deflections.

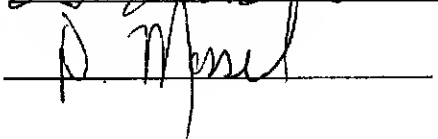
LOADING DEVICE TRAVEL	DIAL INDICATOR	INCLINOMETER
0 inches	<u>0.0000</u>	<u>0</u>
2 inches	<u>0.0000</u>	<u>0</u>
4 inches	<u>0.0147</u>	<u>0</u>
6 inches	<u>0.0235</u>	<u>0</u>
12 inches	<u>0.1835</u>	<u>0</u>
<u>12.467</u> Inches (full travel)	<u>0.1945</u>	<u>0</u>

RECORDED BY:



DATE: 08/30/04

APPROVED BY:



DATA SHEET 4
DATA REDUCTION

VEH. MOD YR/MAKE/MODEL/BODY: 2004 NISSAN MAXIMA PASSENGER CAR
VEH. NHTSA NO.: C45207 ; VIN: 1N4BA41E94C854759
VEH. BUILD DATE: 09/03 ; TEST DATE: AUGUST 30, 2004
TEST LABORATORY: GENERAL TESTING LABS
OBSERVERS: G. FARRAND, J. LATANE

Data from the primary data systems will be analyzed and the plots attached to the data sheet.

RESULTS - The load versus displacement plot showed that - -

TEST #1 - GTL #5242 (LEFT FRONT DOOR)

- A. The initial crush resistance was 3139 lbs.
- B. The intermediate crush resistance was 5039 lbs.
- C. The peak crush resistance was 8647 lbs at 12.661 inches

The time versus displacement plot showed that - -

The rate of loading was .2"/sec

TEST #2 - GTL #5243 (RIGHT REAR DOOR)

- A. The initial crush resistance was 3426 lbs.
- B. The intermediate crush resistance was 5738 lbs.
- C. The peak crush resistance was 11,108 lbs at 12.467 inches

The time versus displacement plot showed that - -

The rate of loading was .2"/sec

Comparison of the ABOVE DATA with the BACKUP DATA indicates the following - -

All data was the same.

RECORDED BY: 

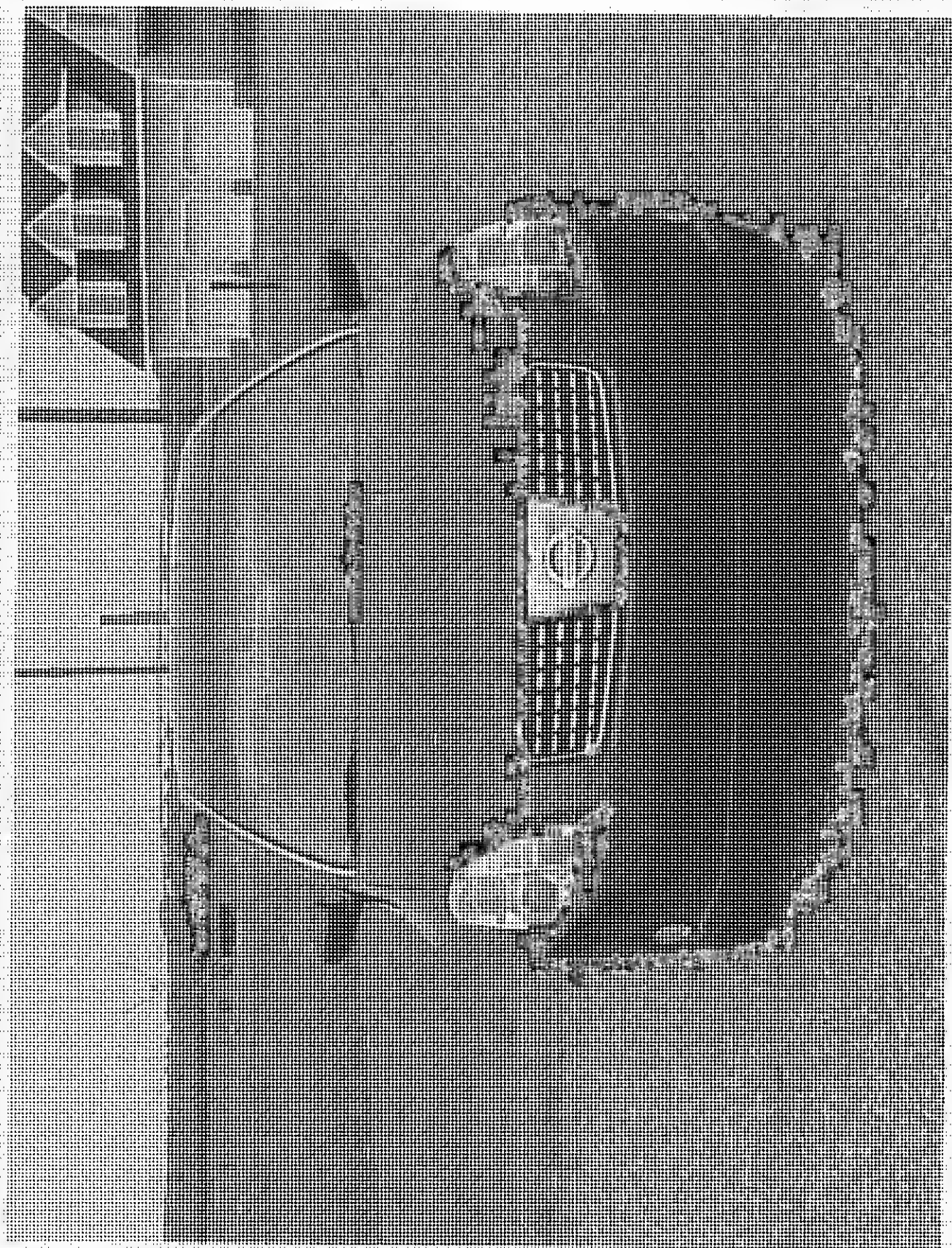
DATE: 08/30/04

APPROVED BY: 

SECTION 4
TEST EQUIPMENT LIST

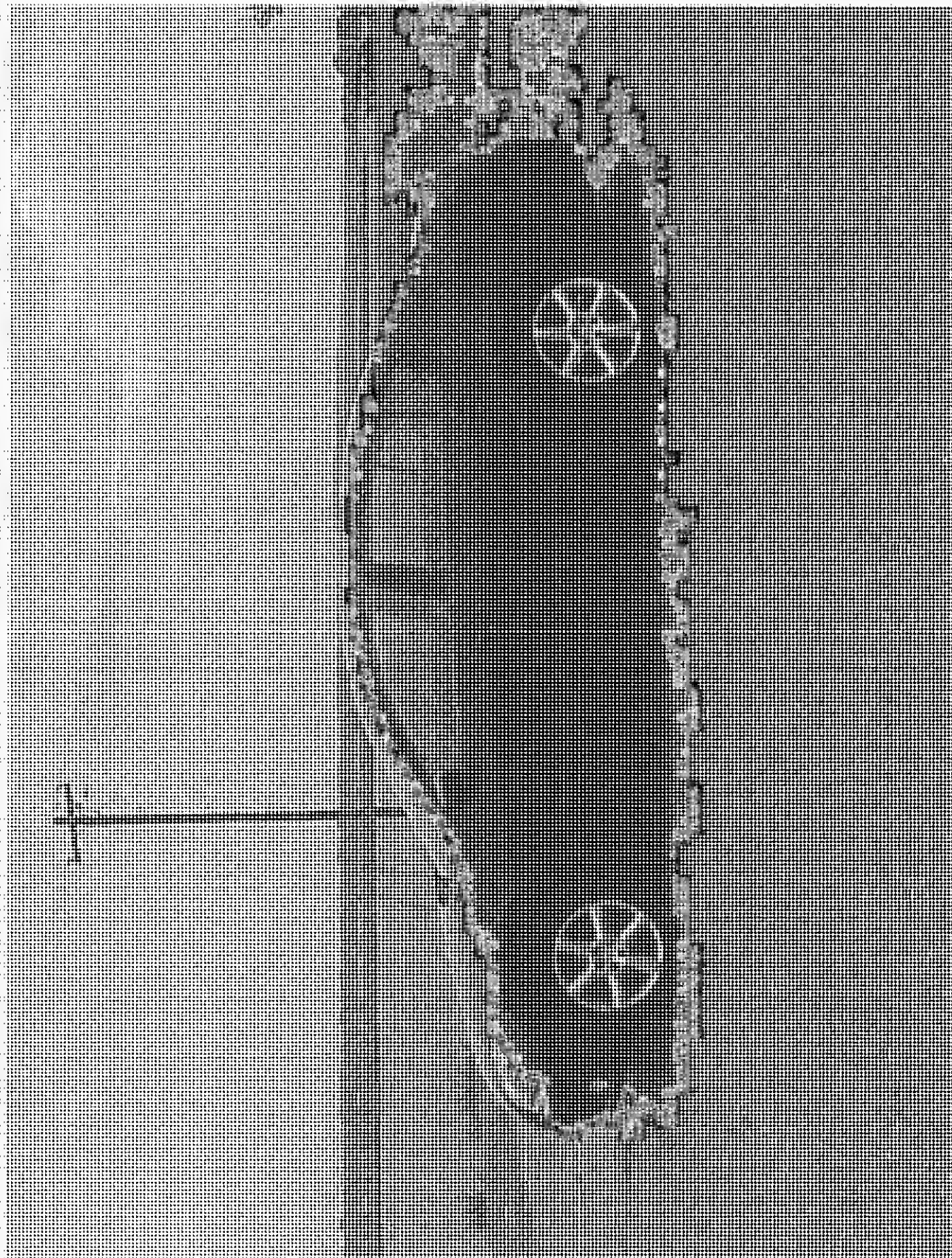
EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
COMPUTER	AT&T	486DX266	N/A	N/A
TEST FIXTURE	GTL 220	220	N/A	N/A
A/D INTERFACE	METRABYTE	DAS-16(F)	BEFORE USE	BEFORE USE
SCALES	FAIRBANKS	N/A	BEFORE USE	BEFORE USE
SIGNAL CONDITIONER	METRABYTE	EXP-RES	BEFORE USE	BEFORE USE
LOAD CELLS	REVERE REVERE	544351A 544551B	11/03 11/03	11/04 11/04
LINEAR POT.	WALDALE WALDALE	123456A 123456B	BEFORE USE	BEFORE USE
INCLINOMETER	STARRETT	360/002	02/04	02/05
DIAL INDICATOR	MIOTO	0001-2	BEFORE USE	BEFORE USE

SECTION 5
PHOTOGRAPHS



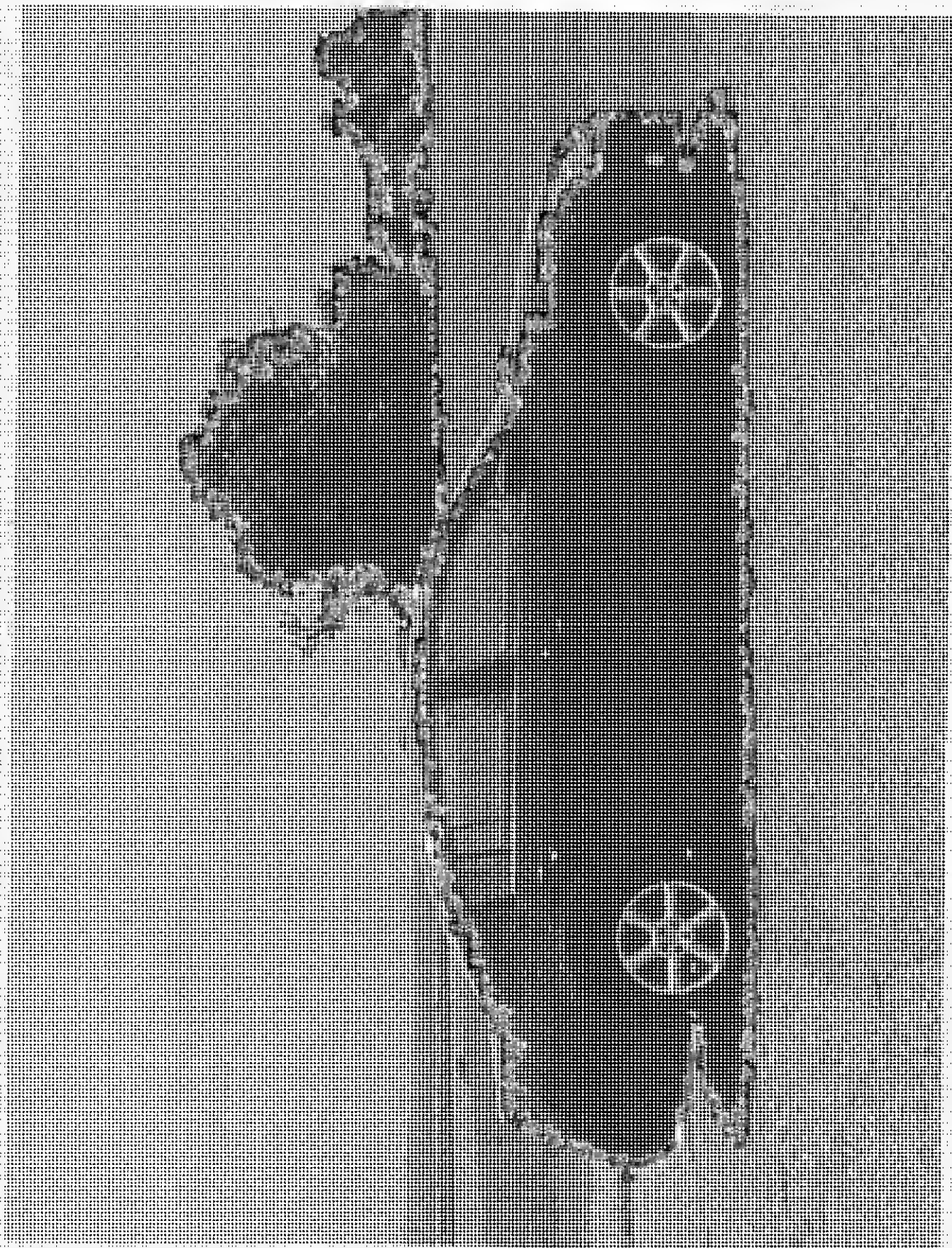
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.1
FRONT VIEW OF VEHICLE PRE-TEST



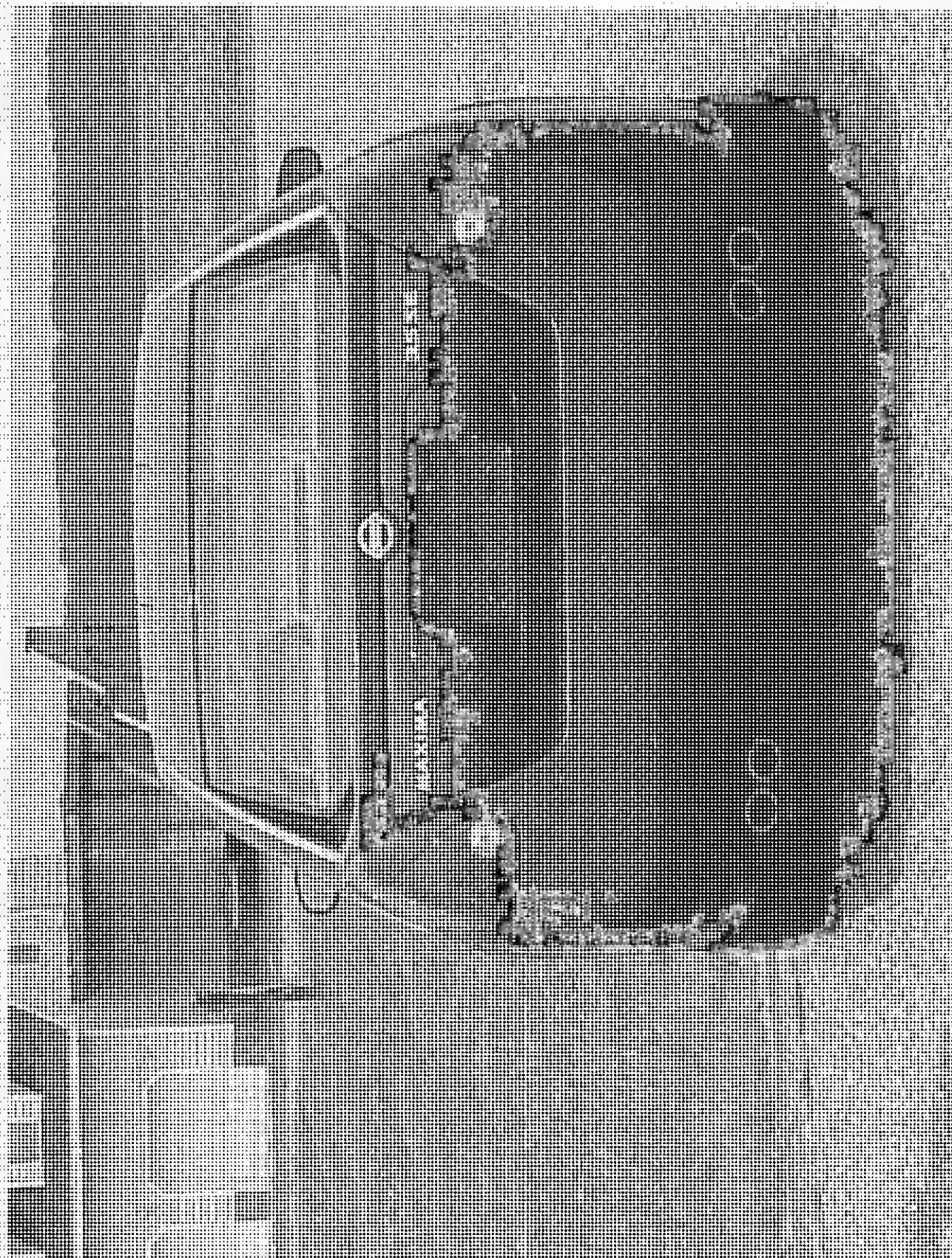
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.2
LEFT SIDE VIEW OF VEHICLE PRE-TEST



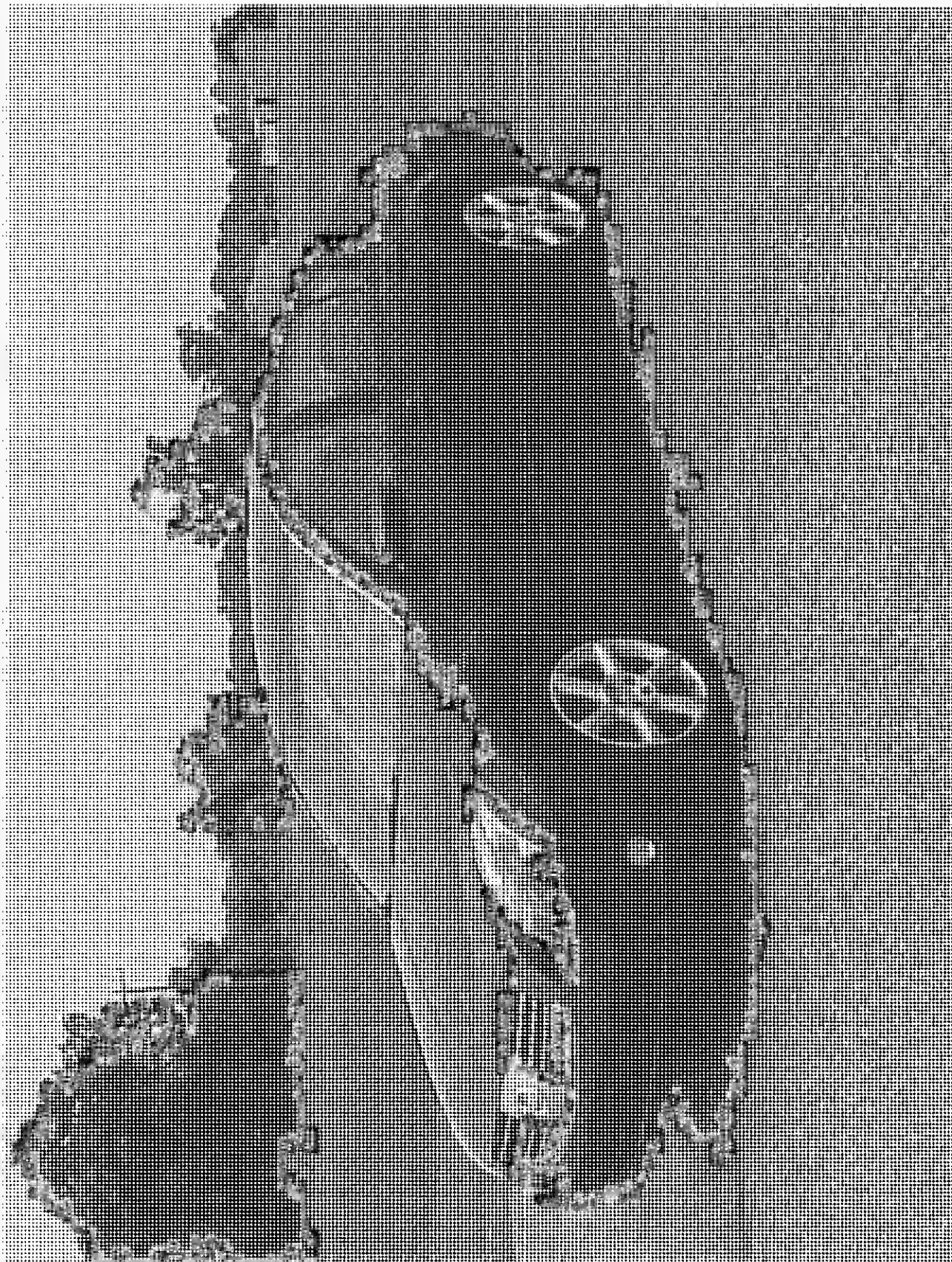
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.3
RIGHT SIDE VIEW OF VEHICLE PRE-TEST



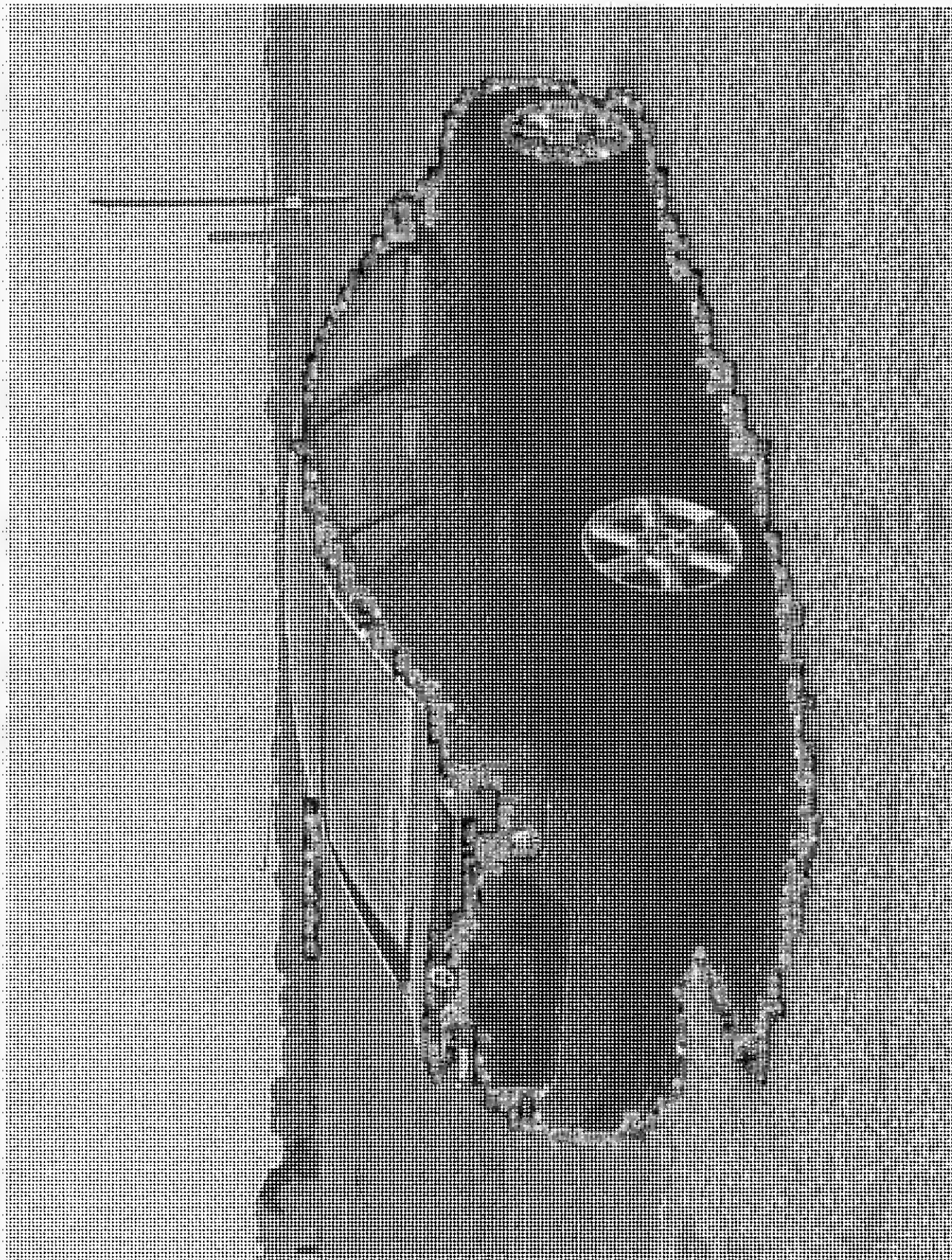
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.4
REAR VIEW OF VEHICLE PRE-TEST



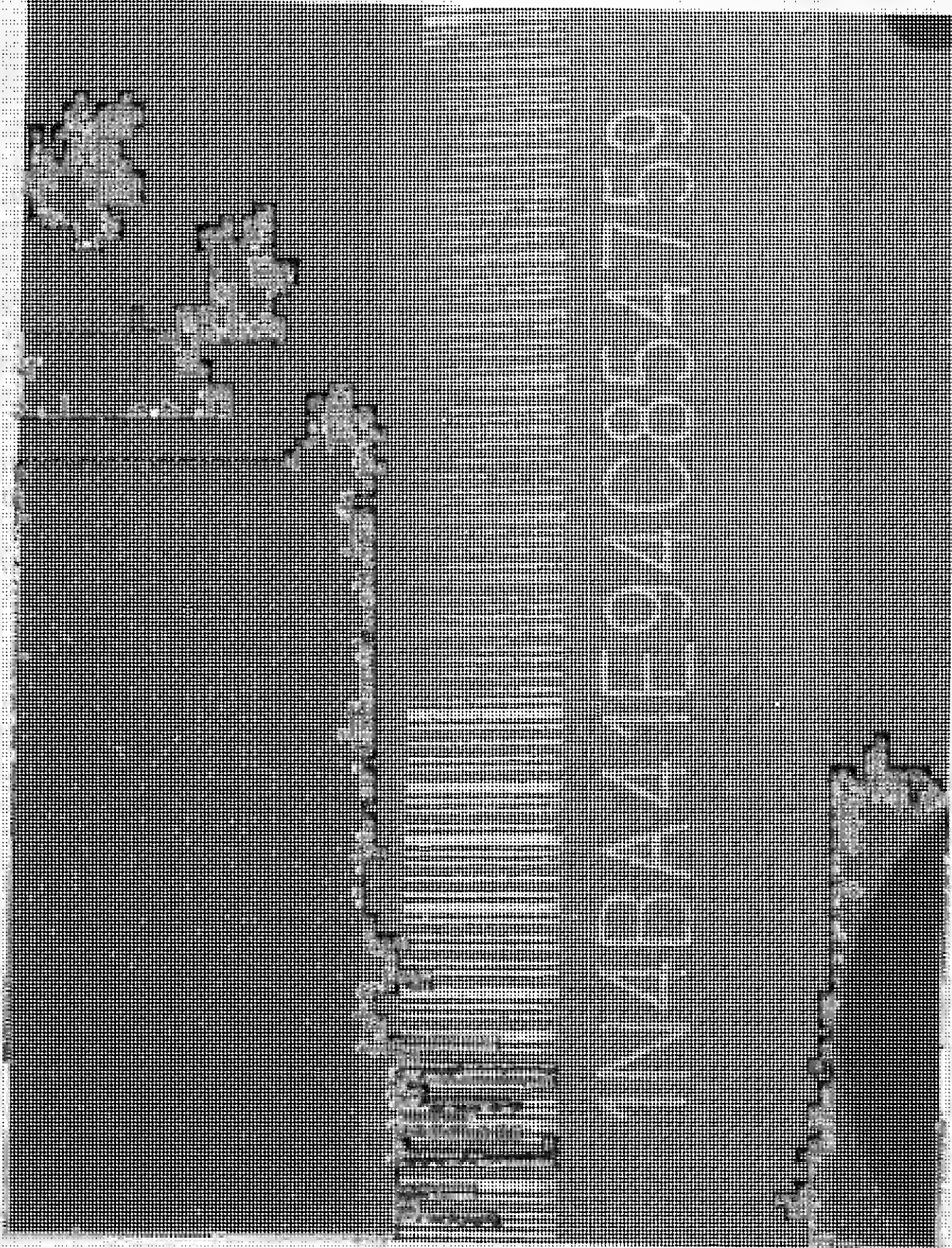
2004 NISSAN MAXIMA
NHTSA NO. C46207
FMVSS NO. 214

FIGURE 5.5
¾ FRONTAL VIEW FROM LEFT SIDE OF
VEHICLE PRE-TEST



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5-3
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
PRE-TEST



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 59
VEHICLE VIN PLATE

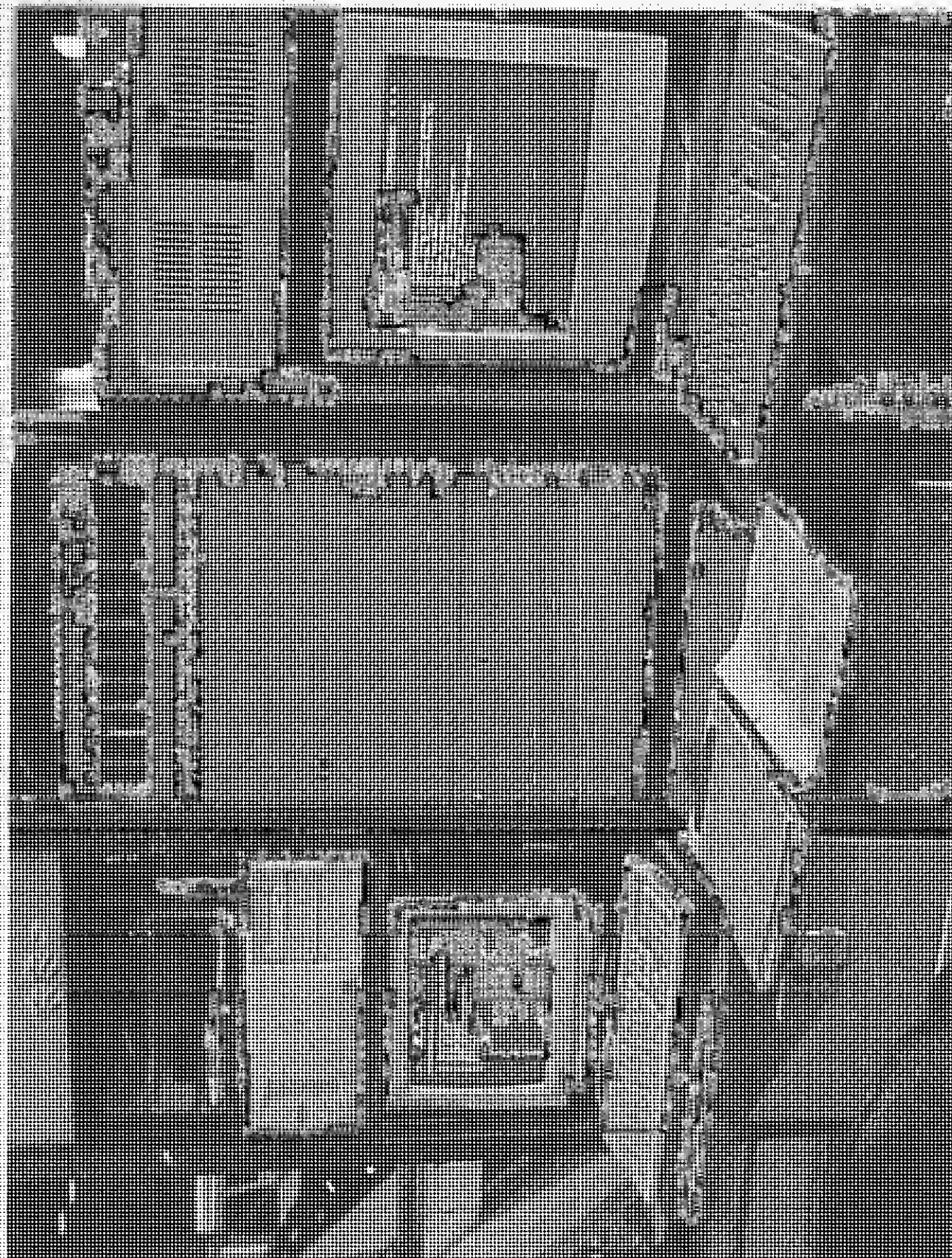
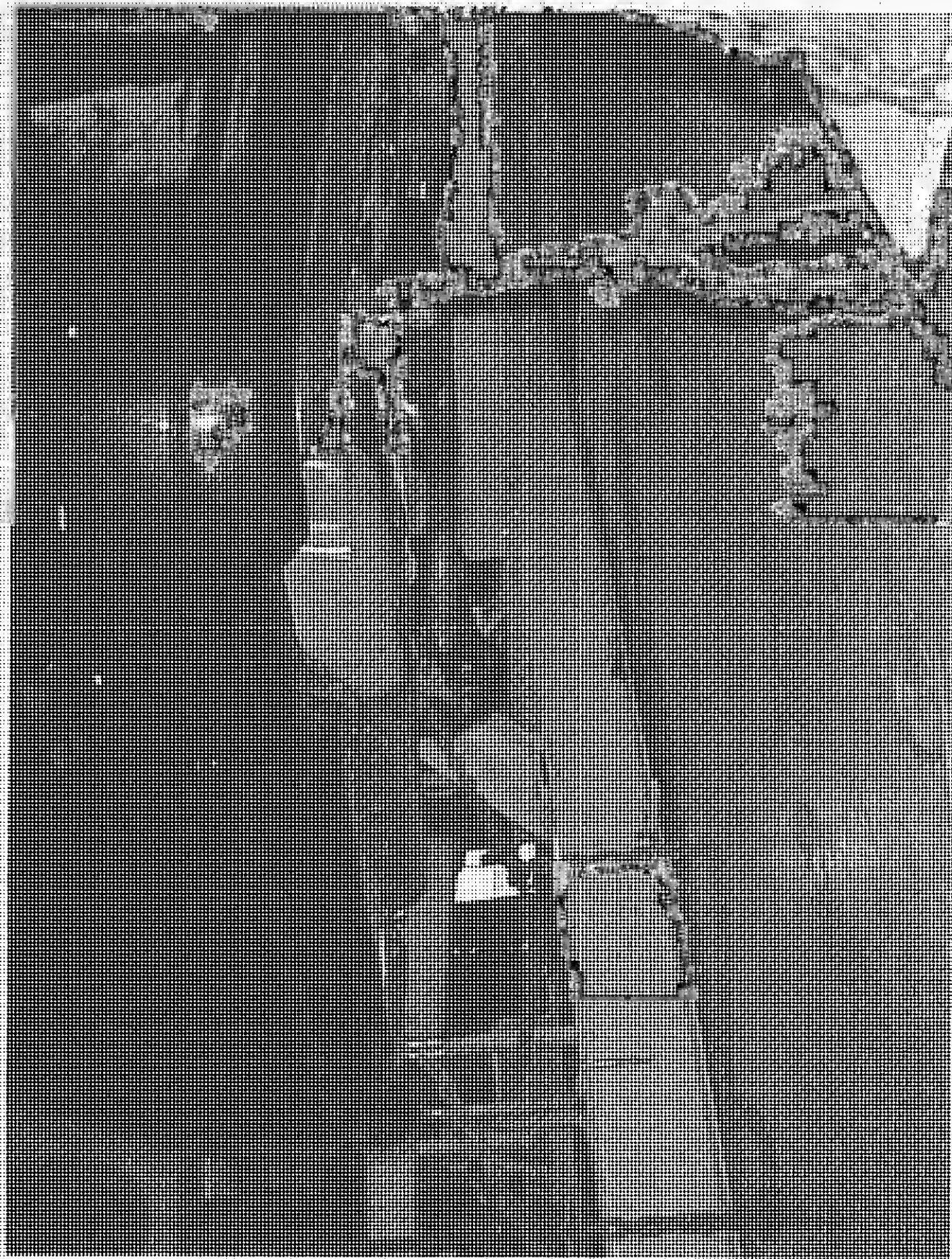


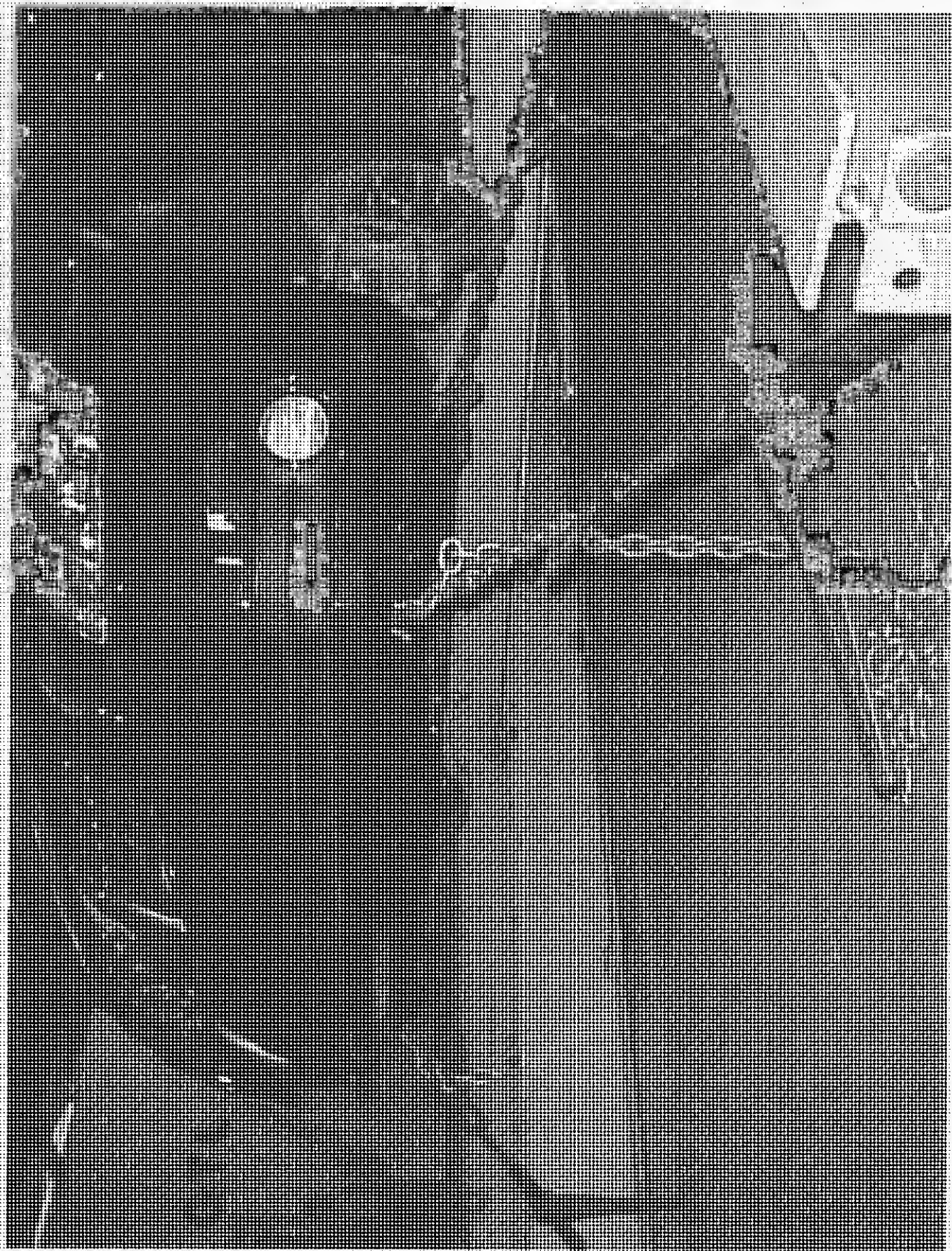
FIGURE 5.10
INSTRUMENTATION SET-UP

2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214



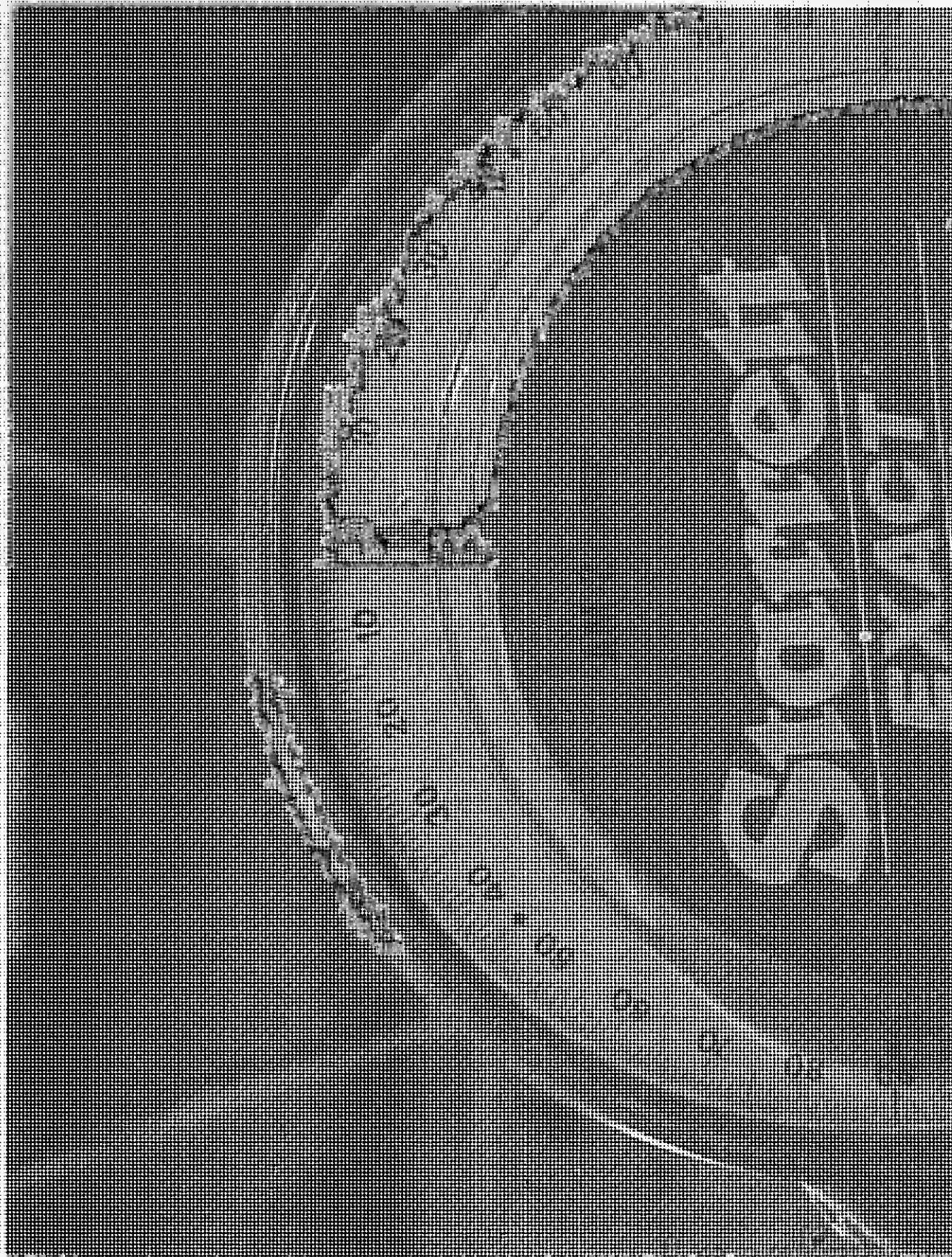
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.11
REAR VEHICLE TIE DOWN - TEST 1



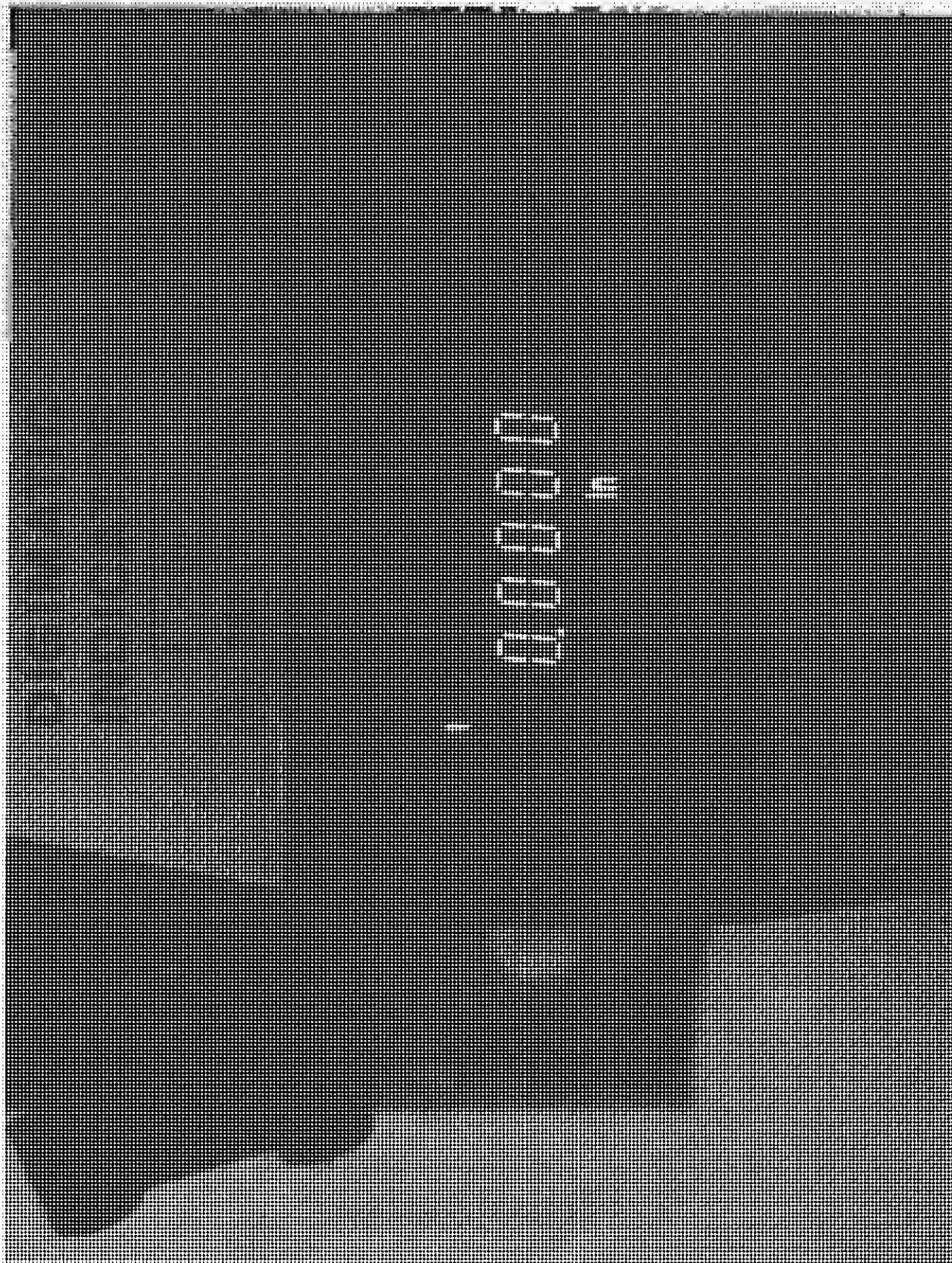
2004 NISSAN MAXIMA
NHSTA NO. C45207
FMVSS NO. 214

FIGURE 5.12
FRONT VEHICLE TIE DOWN - TEST 1



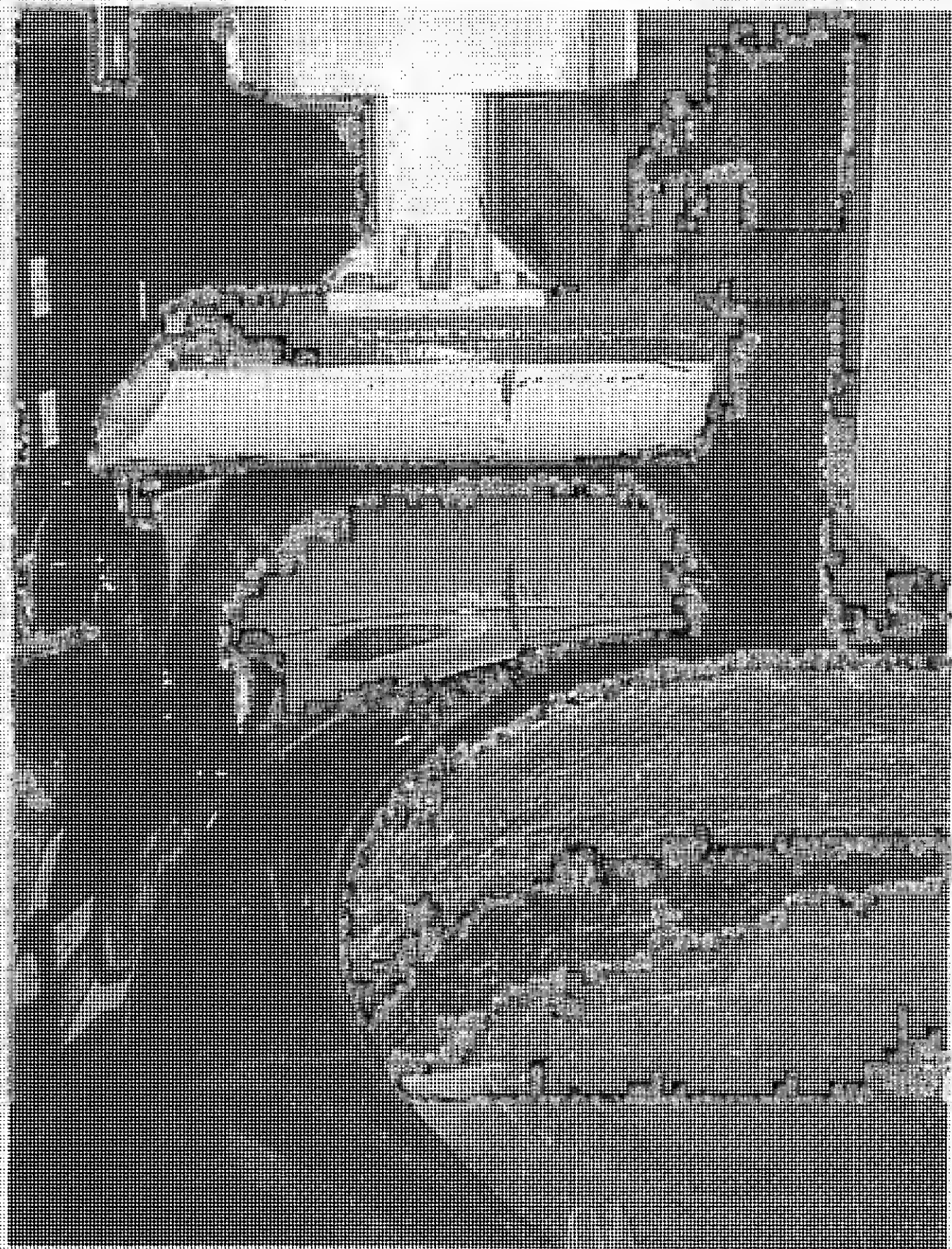
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.13
INCLINOMETER PRE-TEST 1



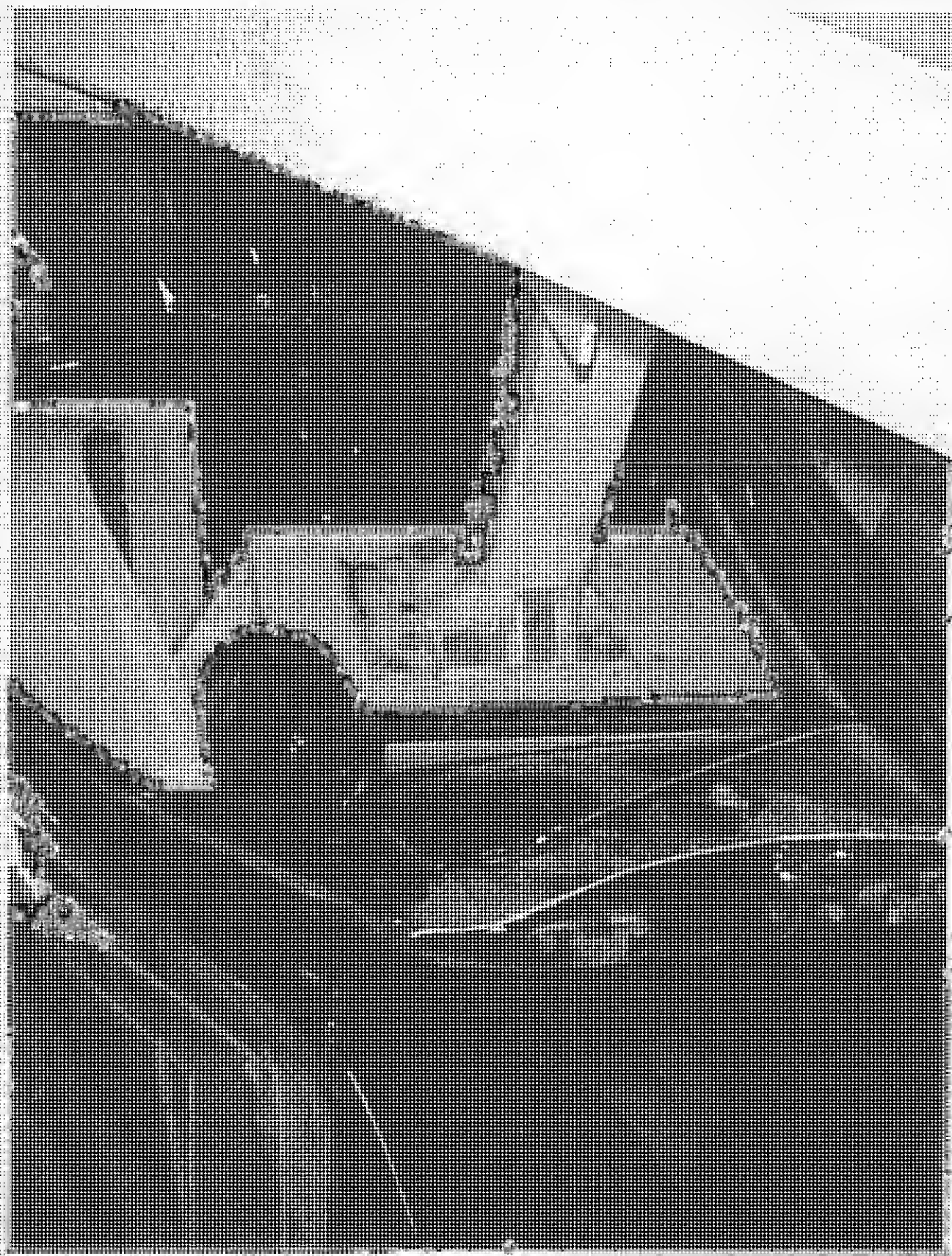
2004 NISSAN MAXIMA
MHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.14
DIAL INDICATOR PHE-TEST 1



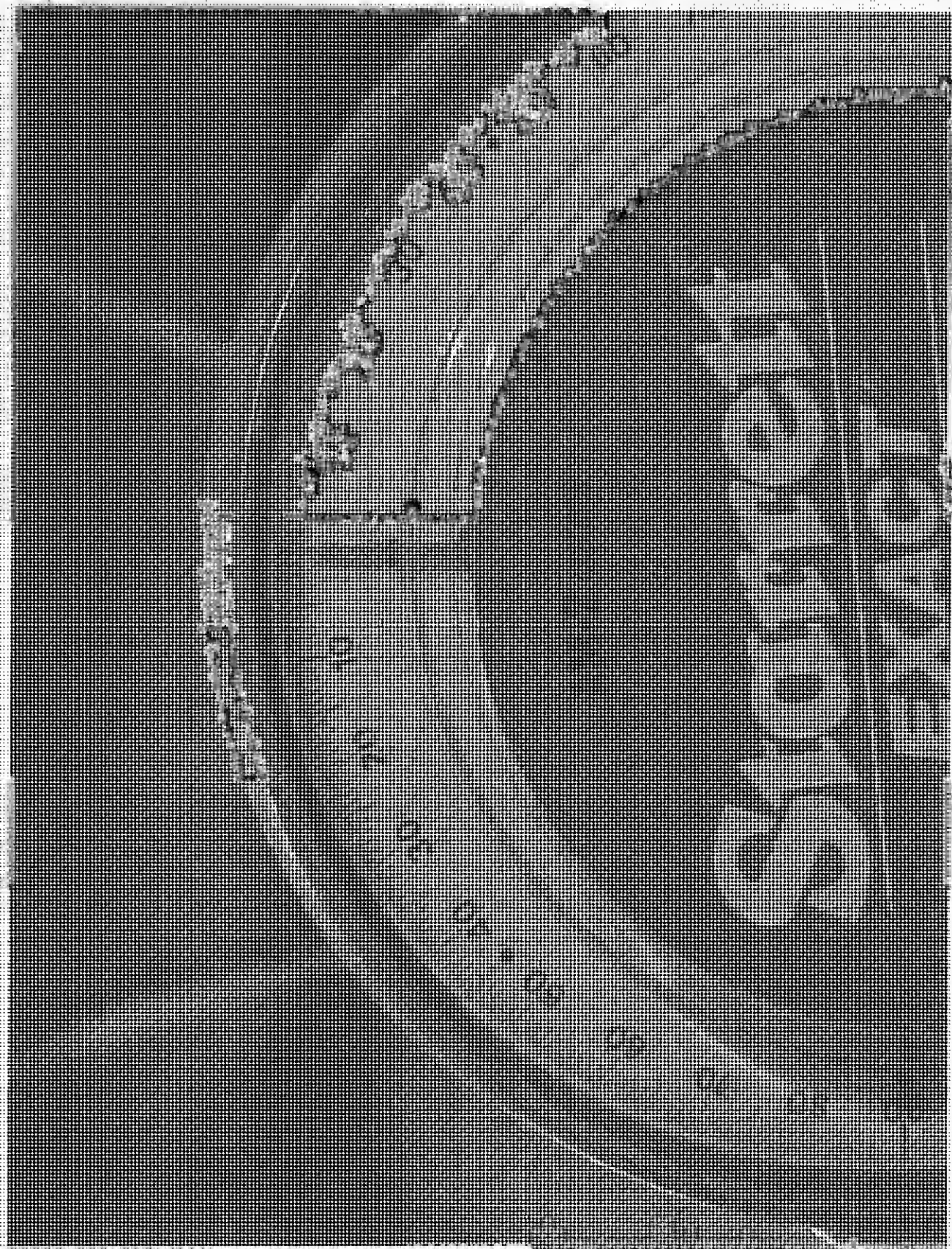
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.15
LOAD DEVICE AGAINST DOOR - PRE-TEST 1



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.16
LOAD DEVICE AGAINST DOOR @ MAX LOAD -
TEST 1



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

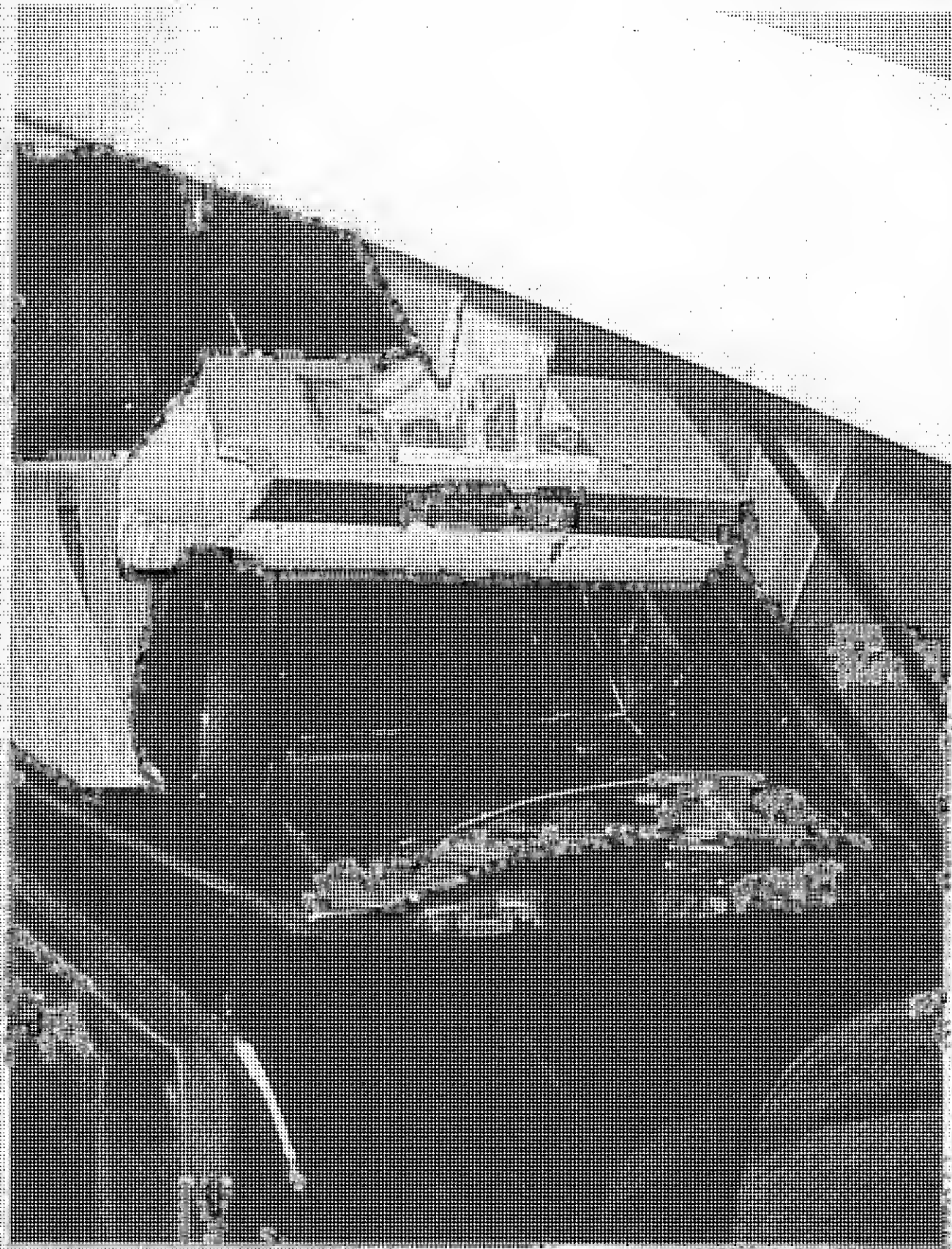
FIGURE 5.17
INCLINOMETER AT MAX LOAD - TEST 1

0.5185

MAX IN

2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.18
DIAL INDICATOR AT MAX LOAD - TEST 1



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.19
POST TEST DOOR OUTSIDE - TEST 1



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.20
POST TEST DOOR INSIDE - TEST 1

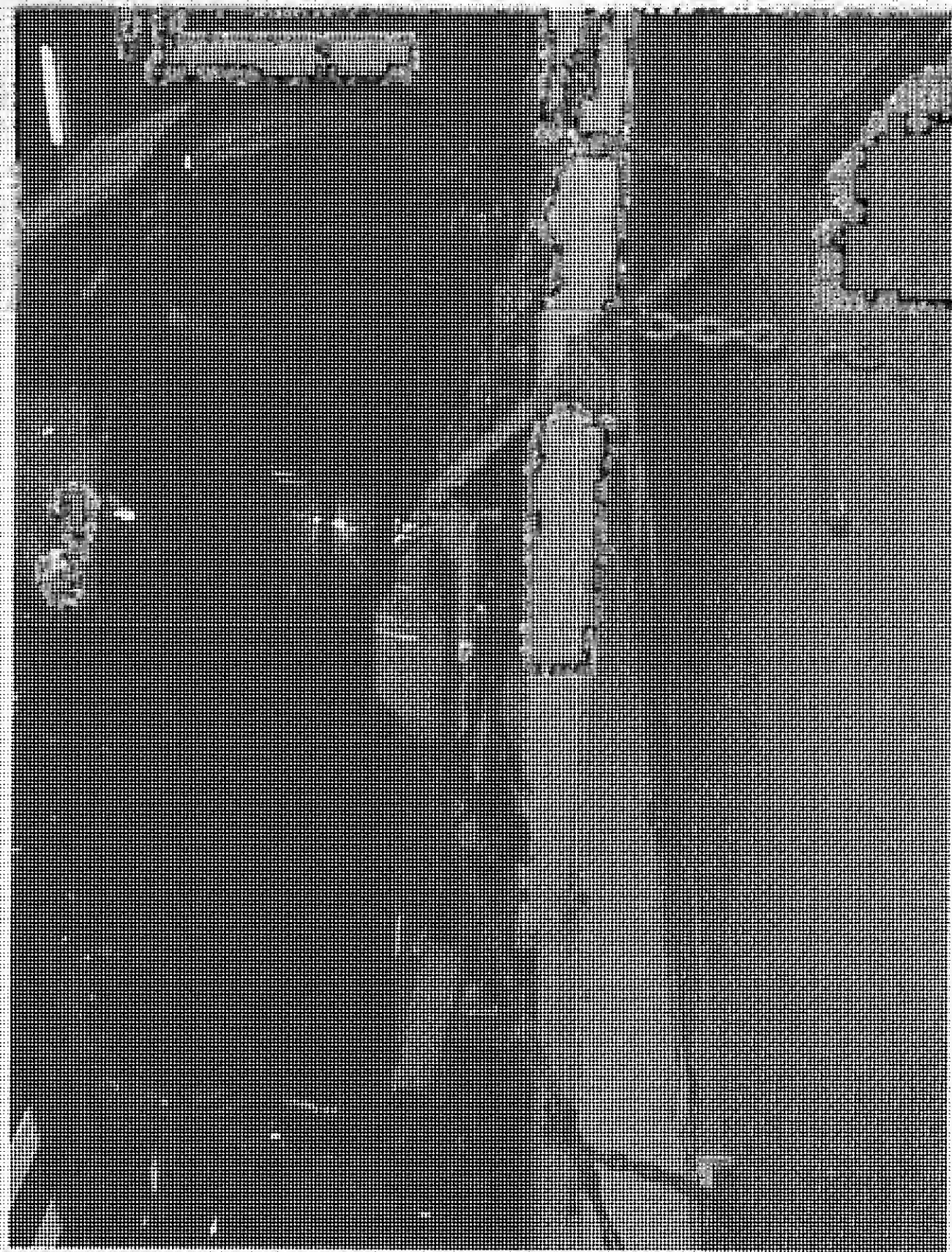


FIGURE 5.21
REAR VEHICLE TIE DOWN - TEST 2

2004 NISSAN MAXIMA
AHTSA NO. C45207
FMVSS NO. 214

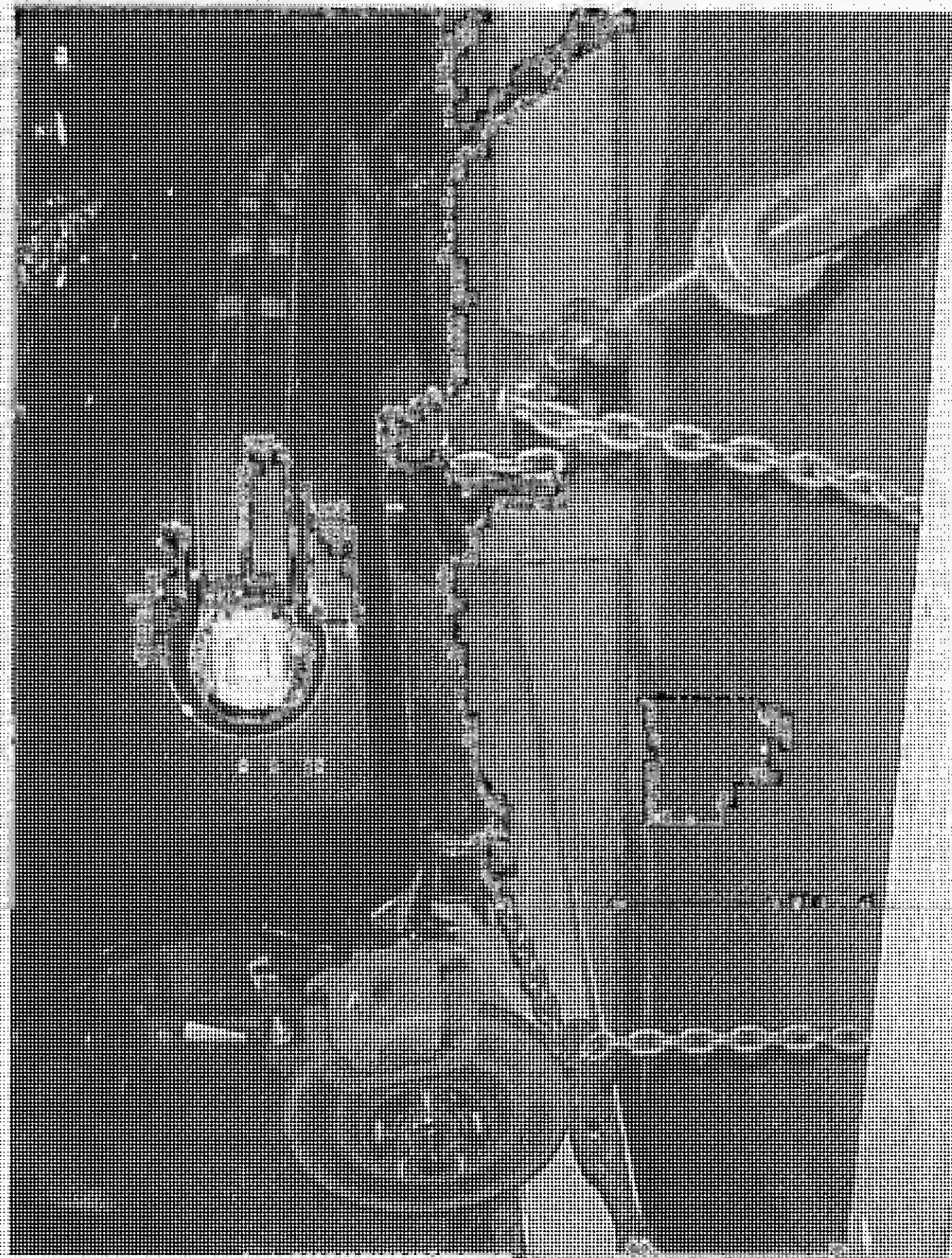


FIGURE 5.22
FRONT VEHICLE TIE DOWN - TEST 2

2004 NISSAN MAXIMA
MHTSA NO. C-65207
MVSS NO. 214

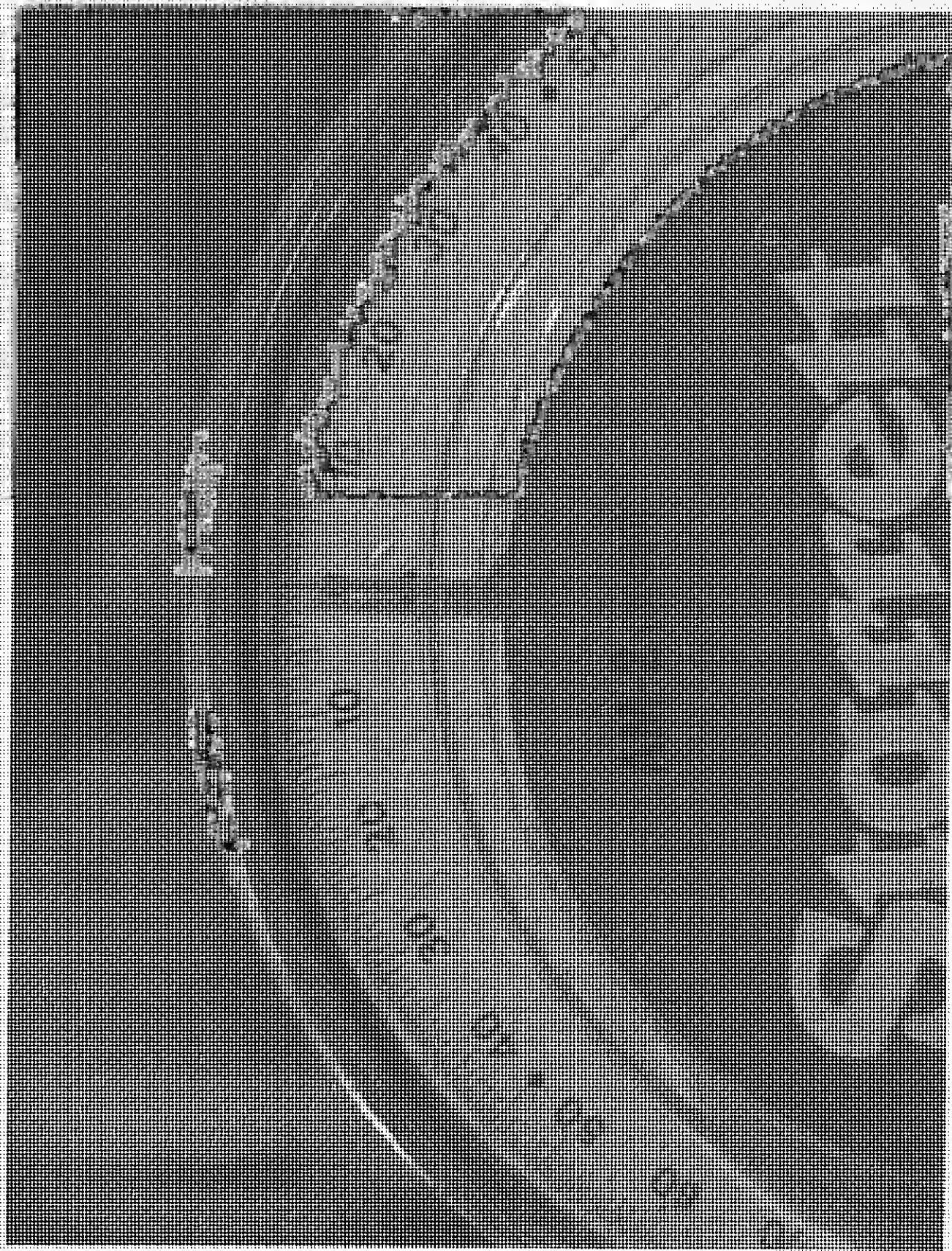
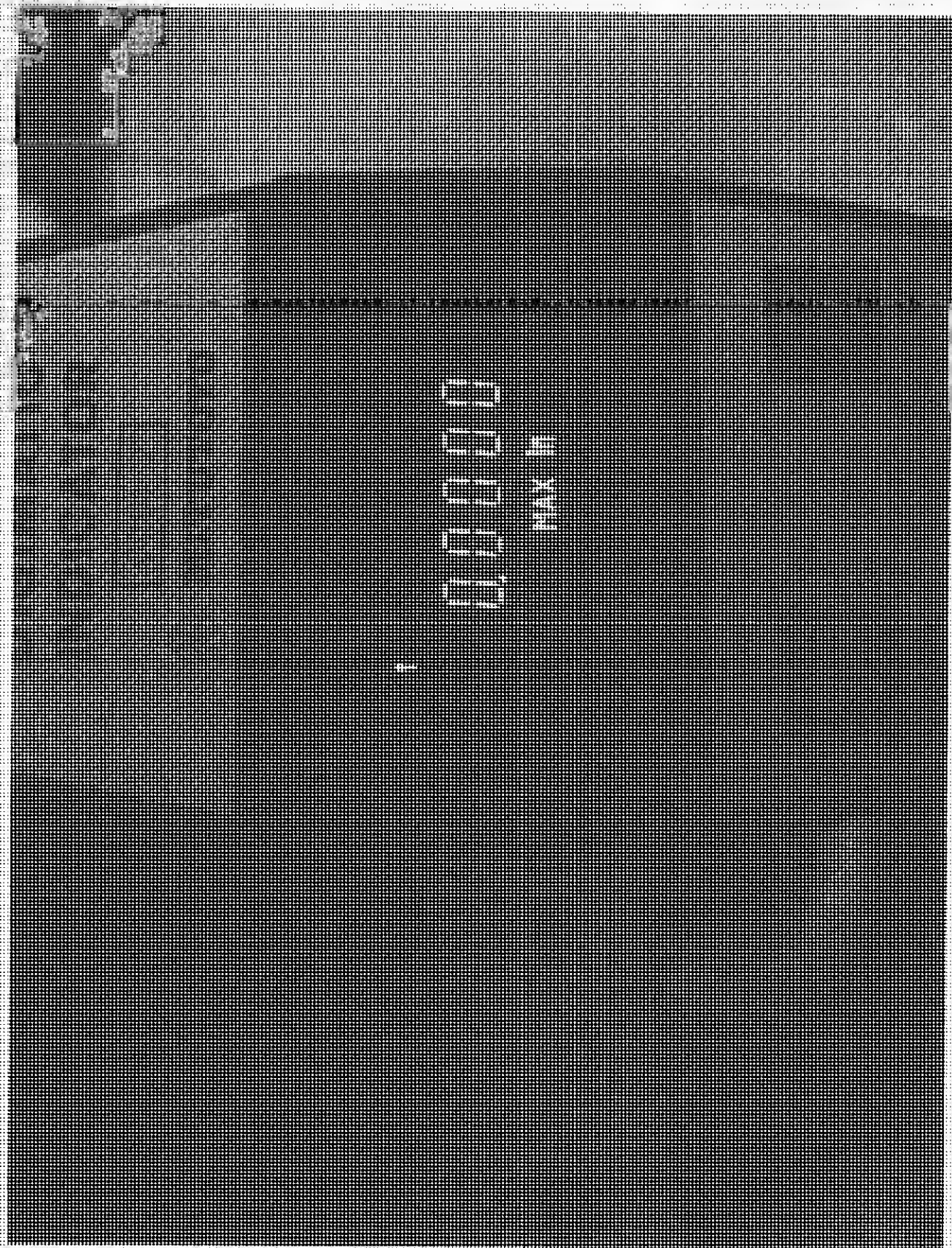


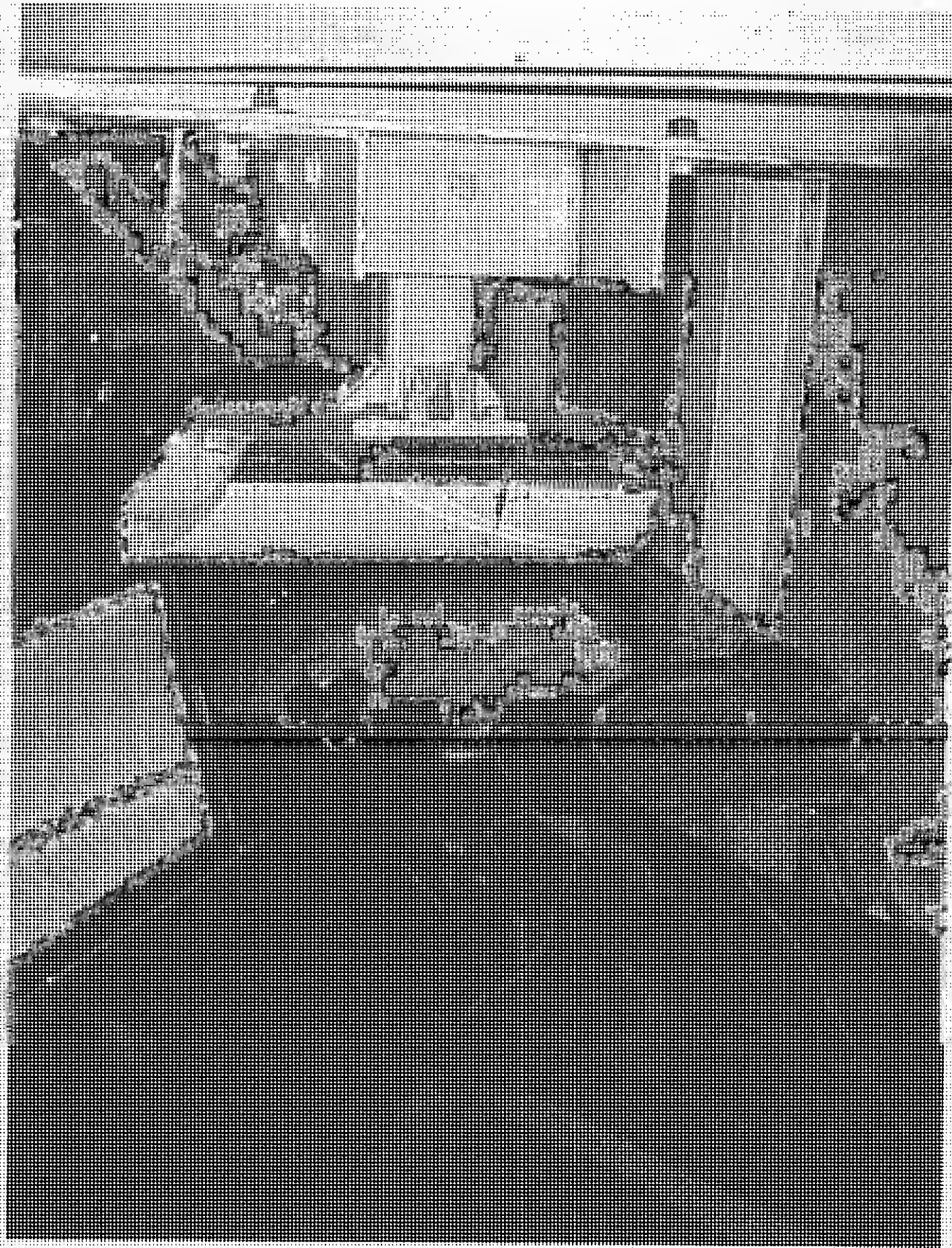
FIGURE 5.23
INCLINOMETER PRE-TEST 2

2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.24
DIAL INDICATOR PRE-TEST 2



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.25
LOAD DEVICE AGAINST DOOR - PRE-TEST 2



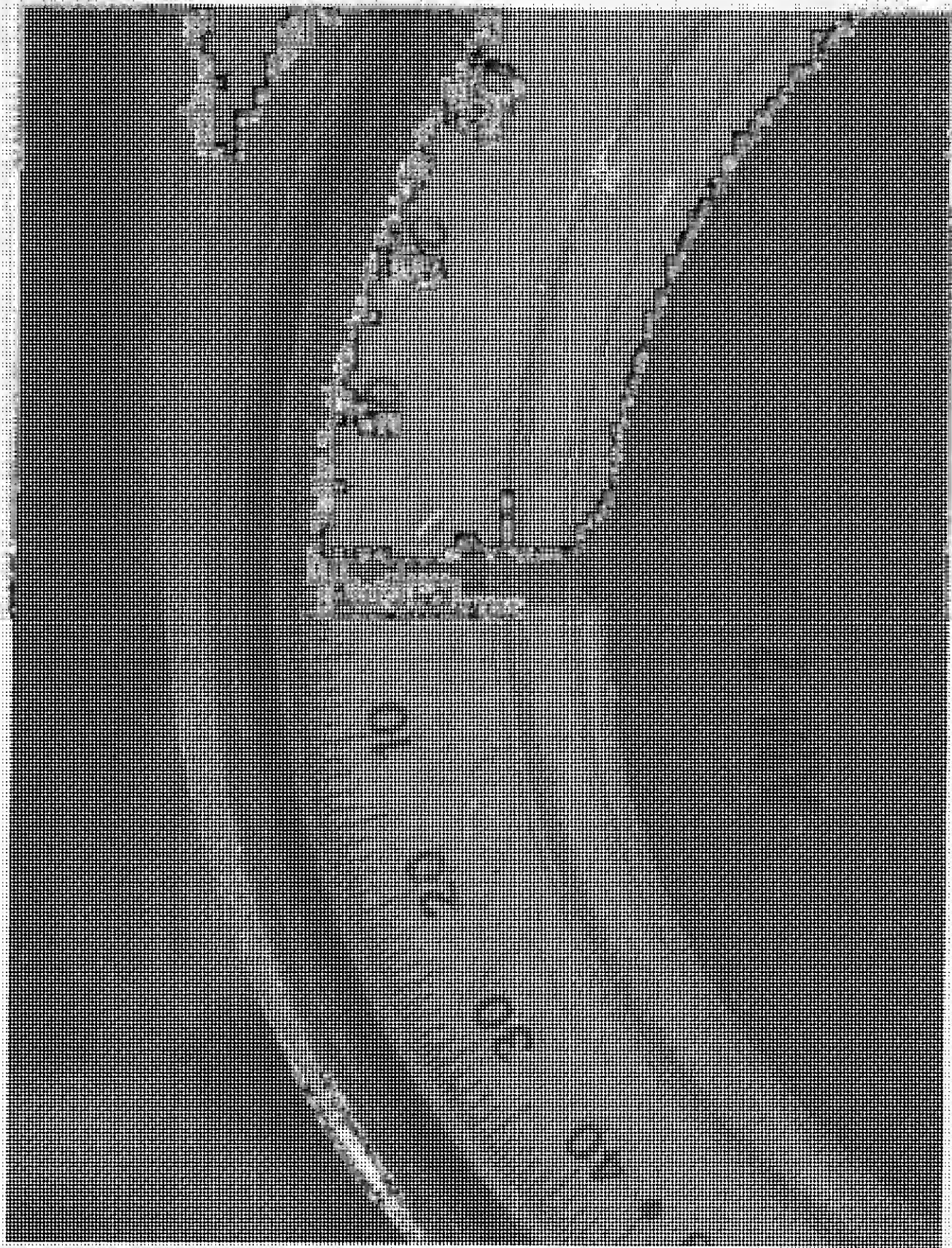
FIGURE 5.26
LOAD DEVICE AGAINST DOOR @ MAX LOAD
TEST 2

2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214



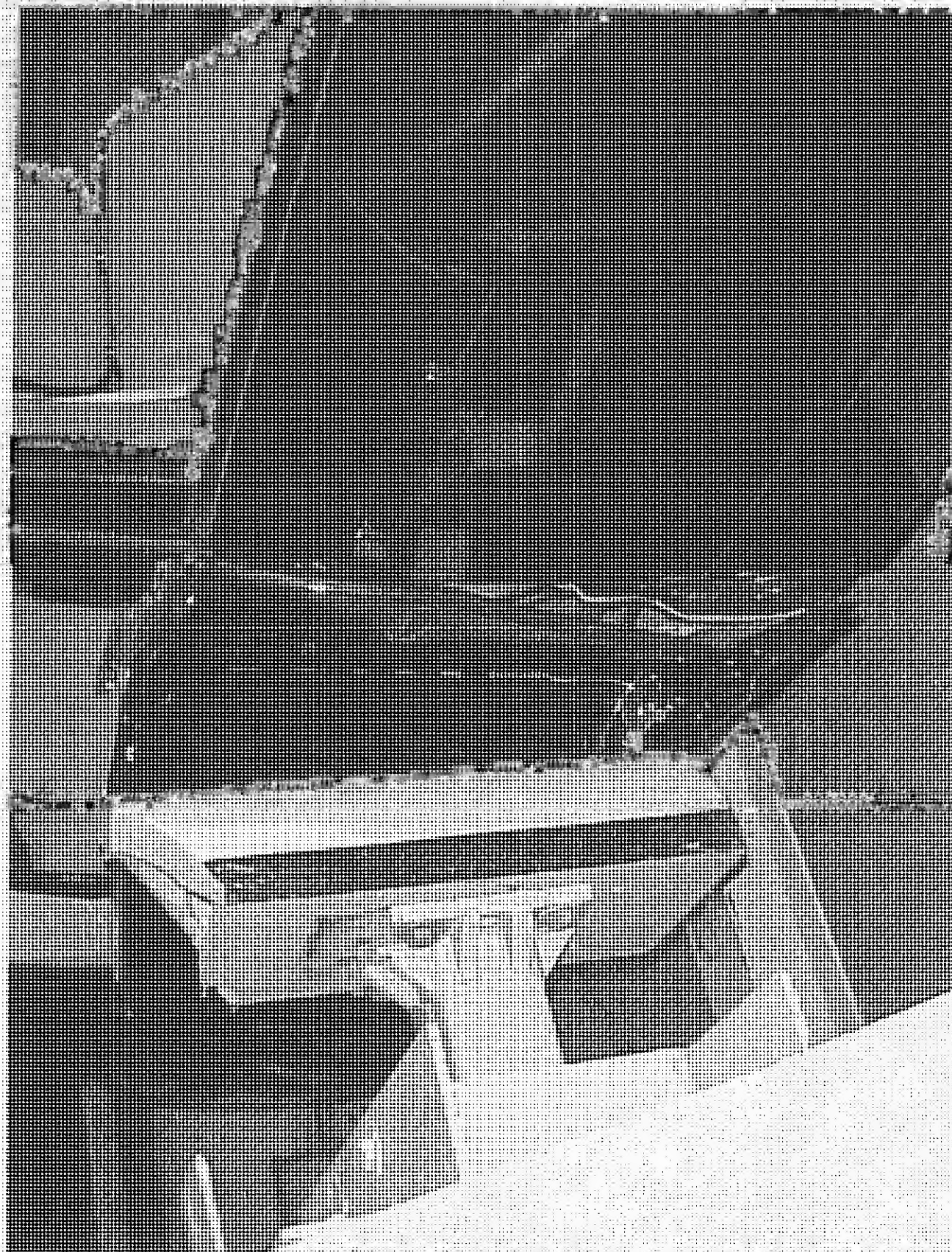
2004 NISSAN MAXIMA
NH4TSA NO. C45207
FMVSS NO. 214

FIGURE 5.27
INCLINOMETER AT MAX LOAD - TEST 2



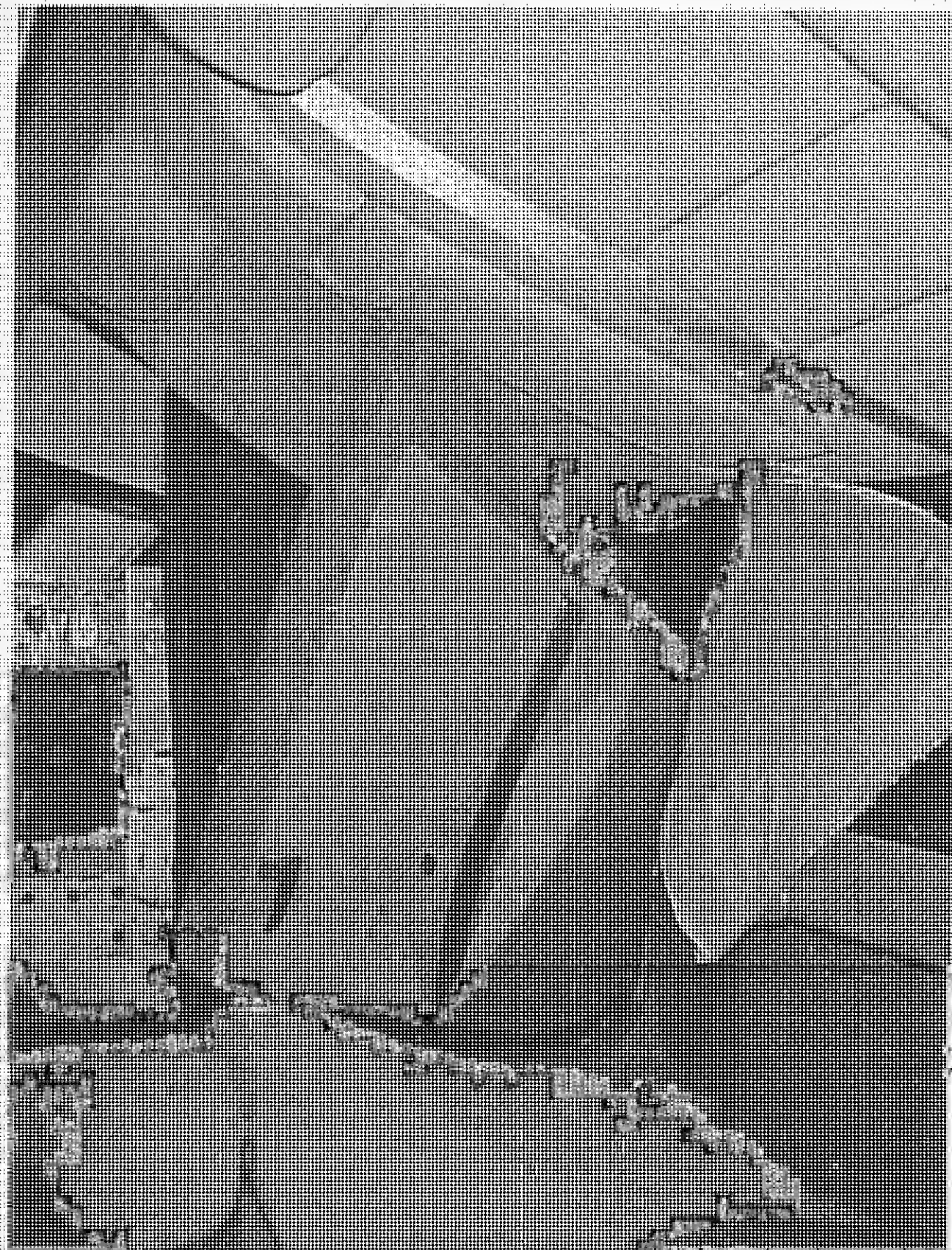
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.28
DIAL INDICATOR AT MAX LOAD - TEST 2



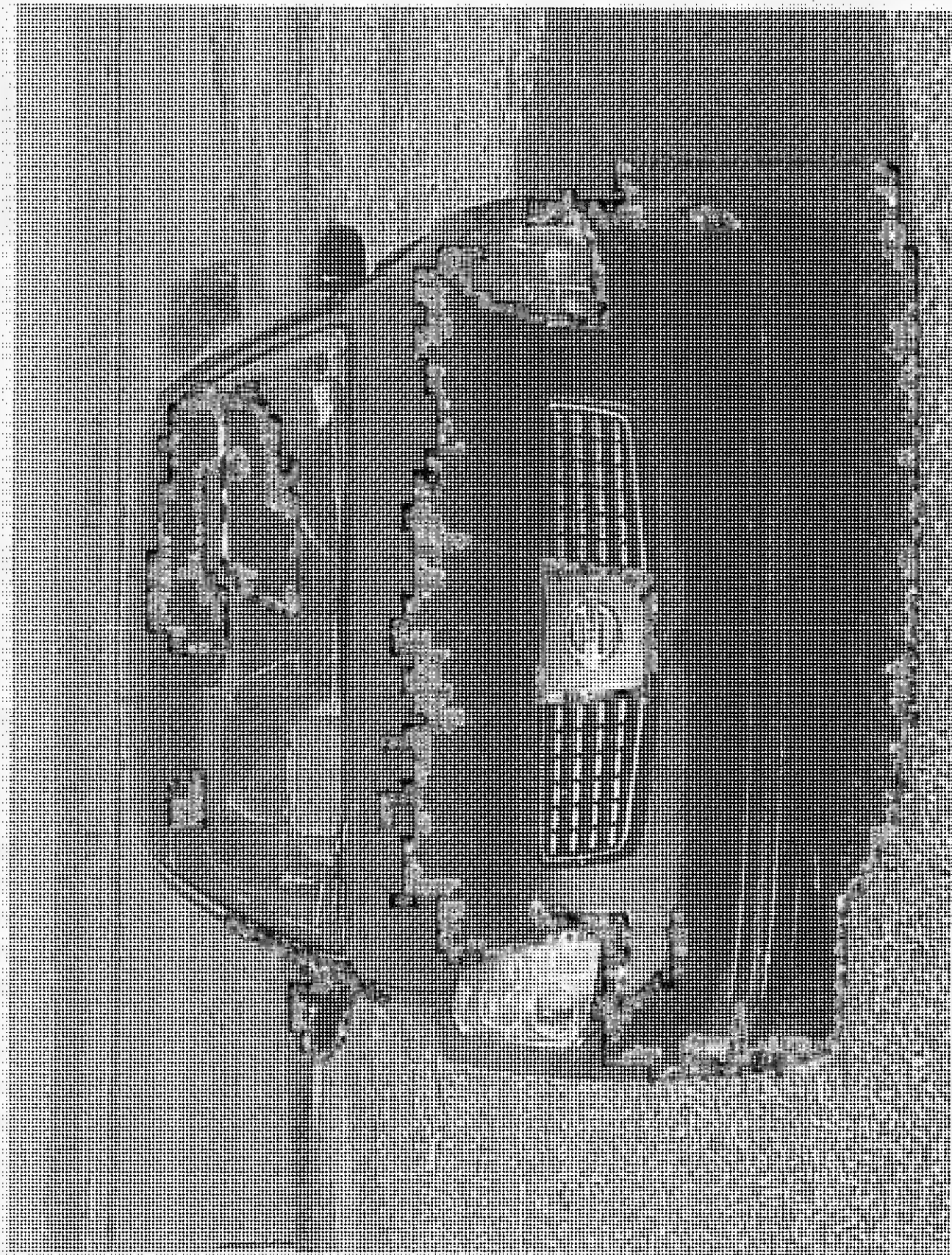
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 6.29
POST TEST DOOR OUTSIDE - TEST 2



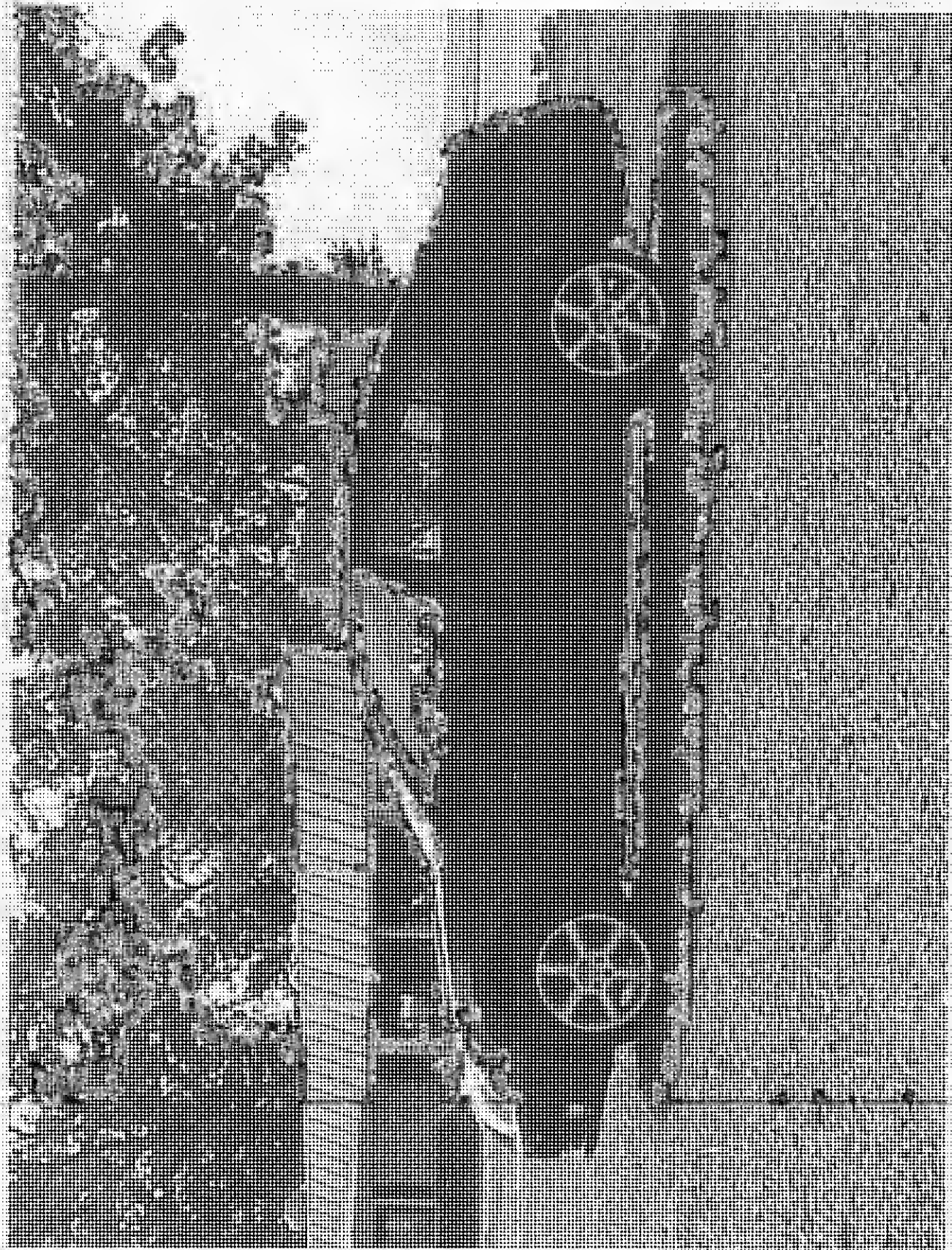
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 216

FIGURE 5.30
POST TEST DOOR INSIDE - TEST 2



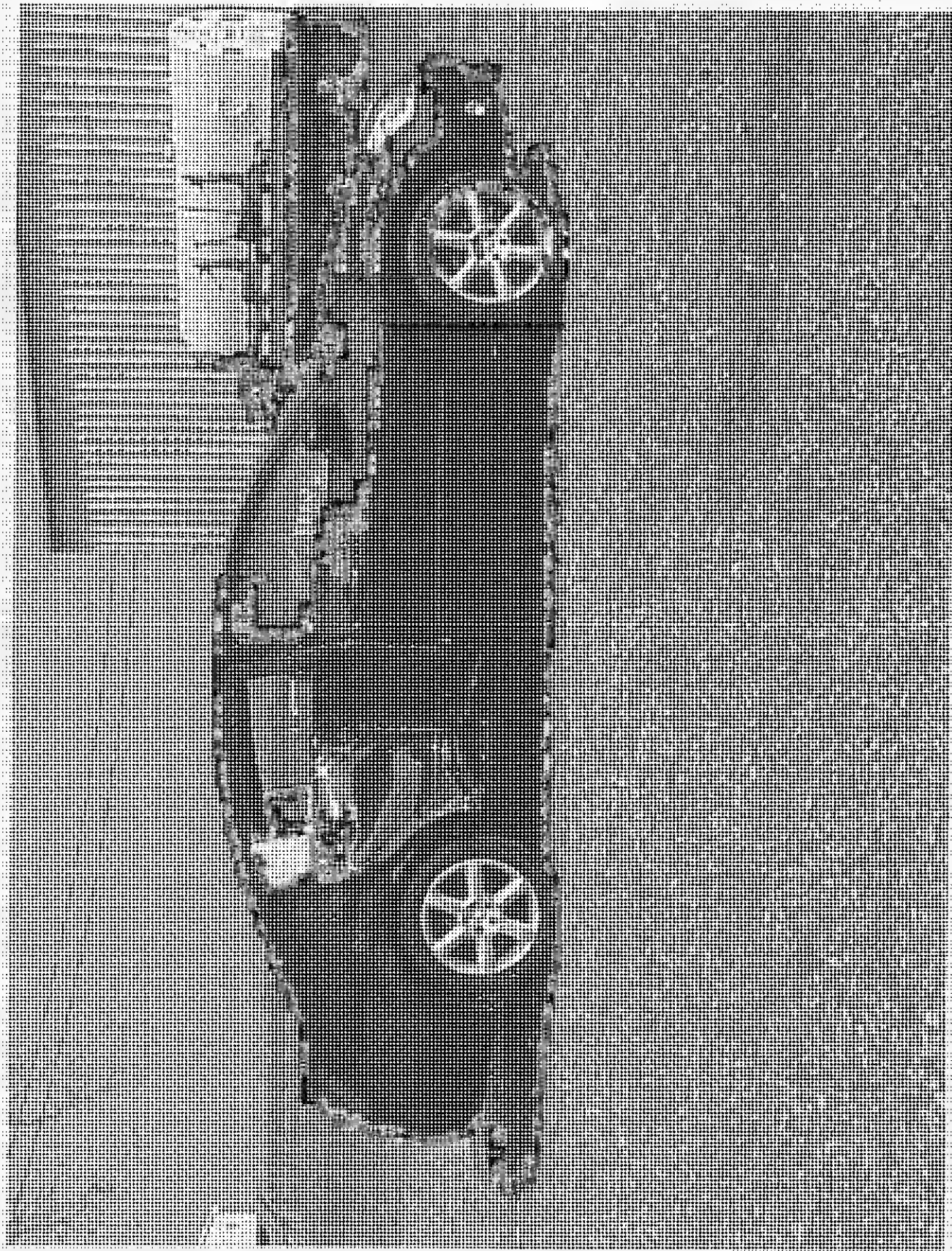
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.31
FRONT VIEW OF VEHICLE POST TEST



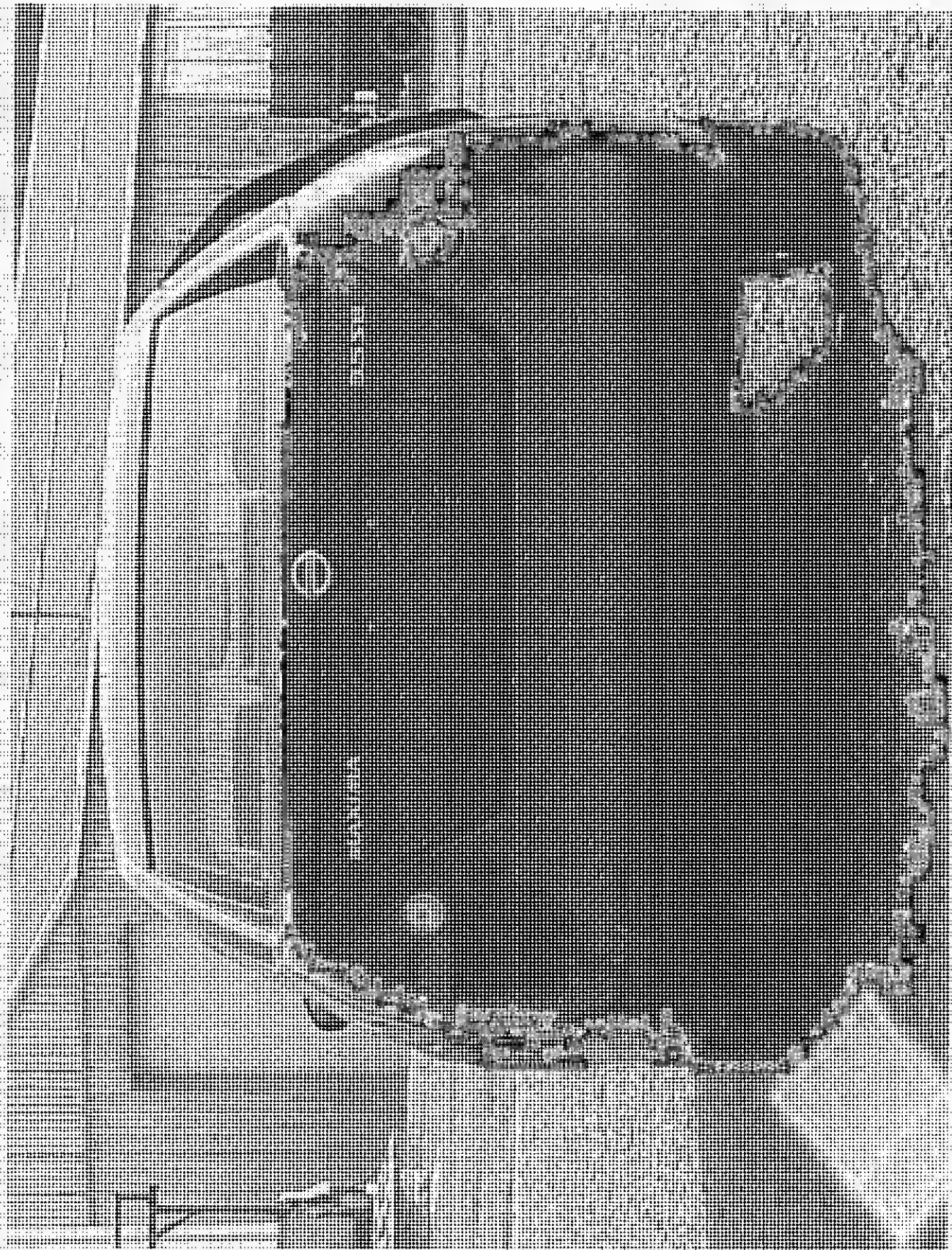
2004 NISSAN MAXIMA
NHISA NO. C45207
FMVSS NO. 214

FIGURE 5.32
LEFT SIDE VIEW OF VEHICLE POST TEST



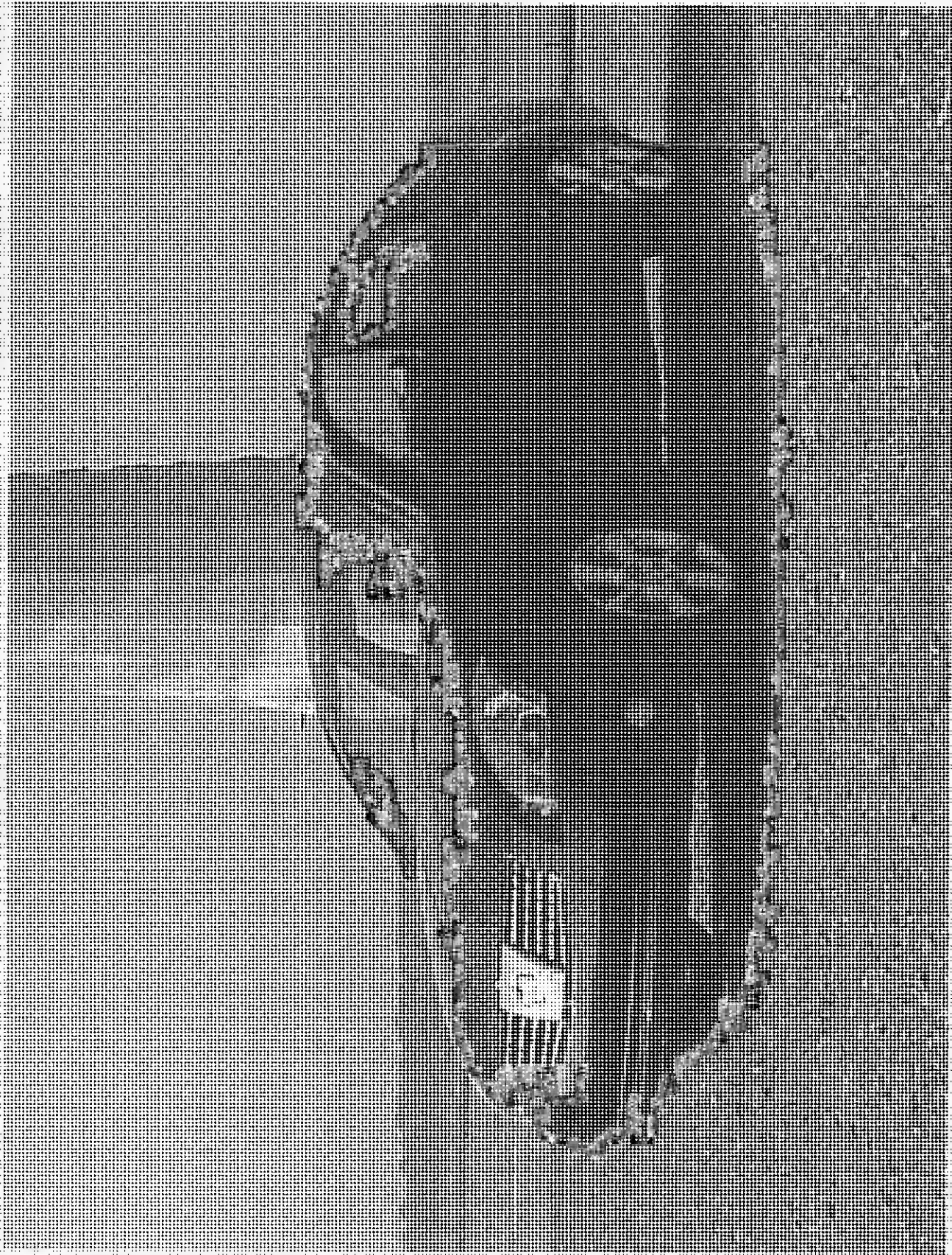
2004 NISSAN MAXIMA
NHSTA NO. C45207
FMVSS NO. 214

FIGURE 5.33
RIGHT SIDE VIEW OF VEHICLE POST TEST



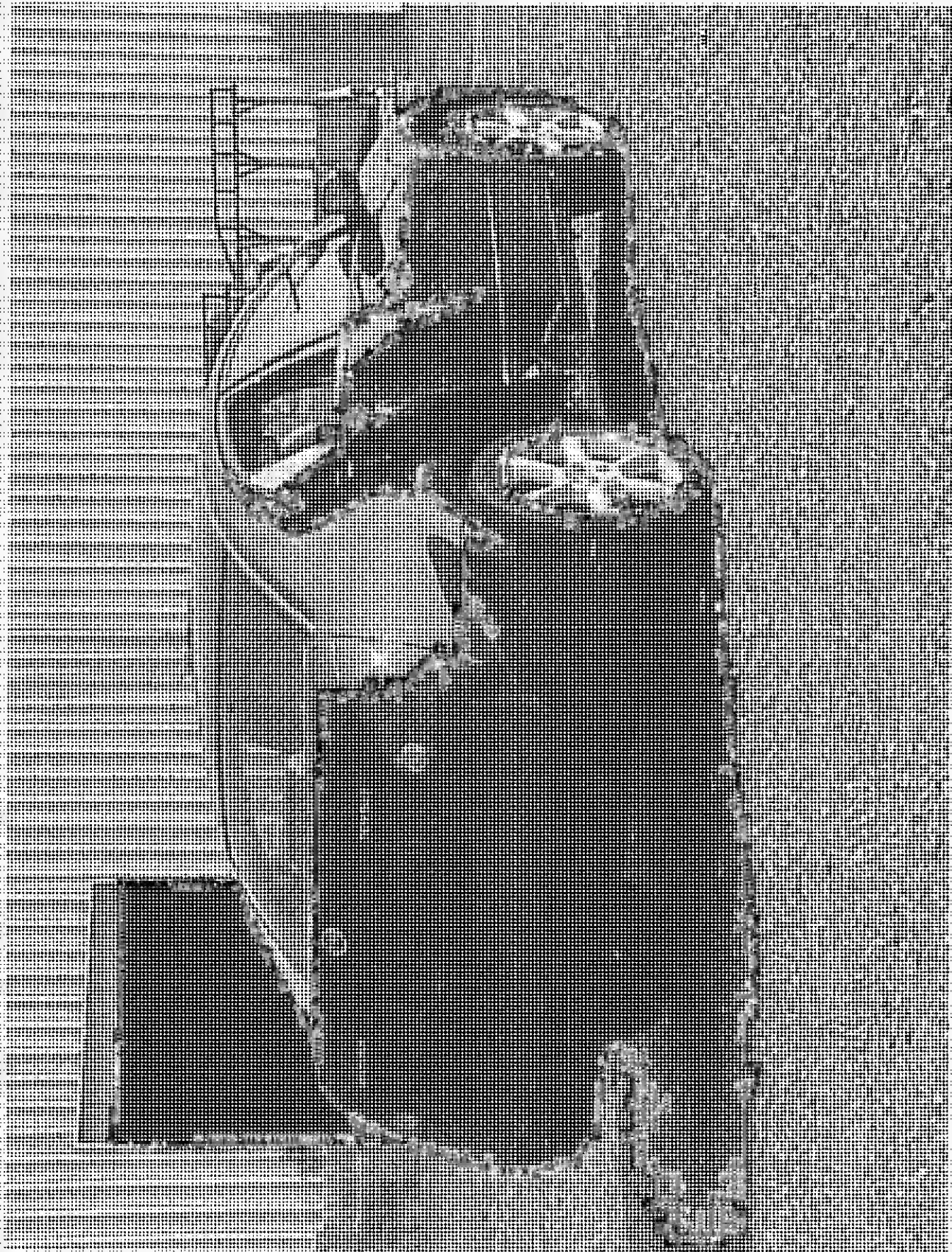
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.34
REAR VIEW OF VEHICLE POST TEST



2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.35
¾ FRONTAL VIEW FROM LEFT SIDE OF
VEHICLE POST TEST



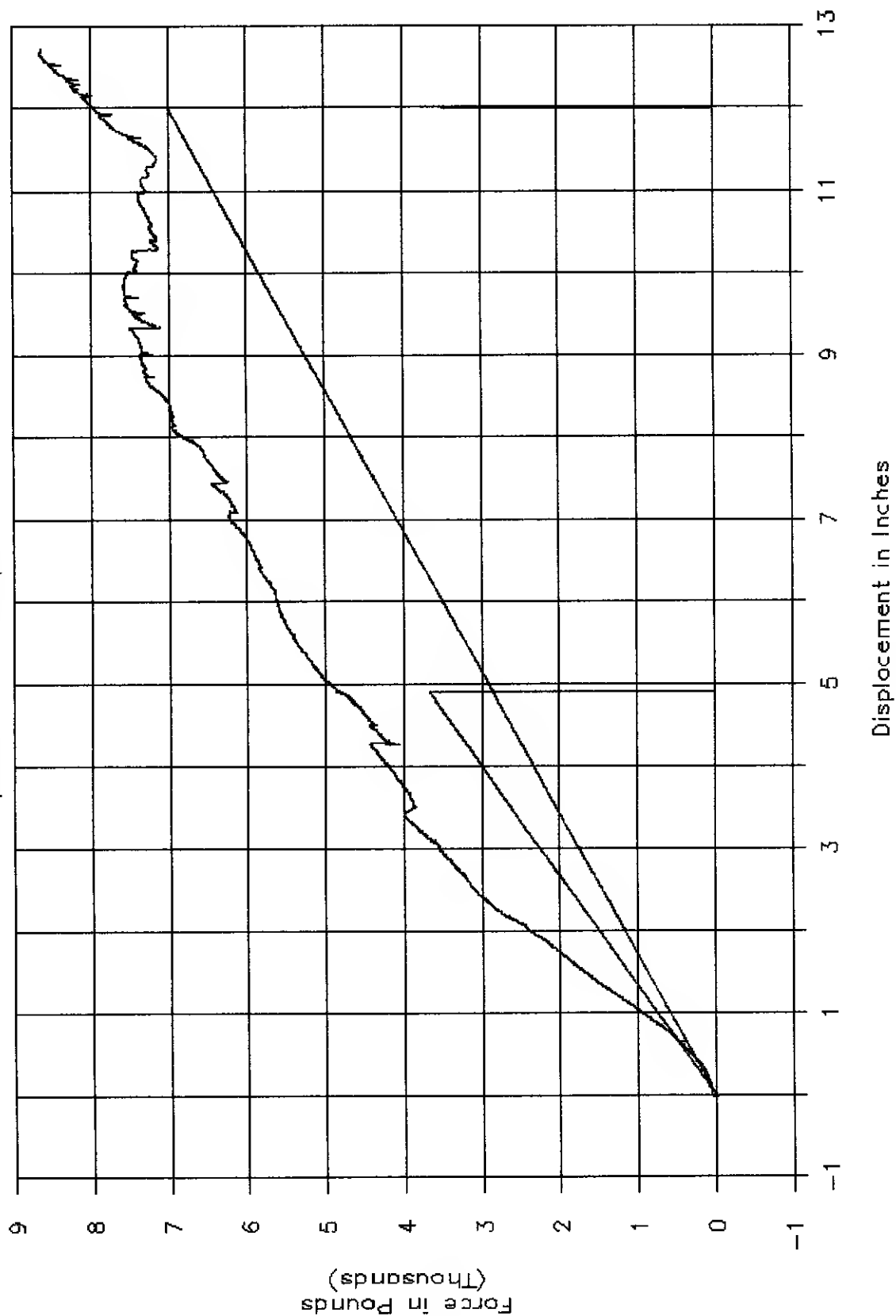
2004 NISSAN MAXIMA
NHTSA NO. C45207
FMVSS NO. 214

FIGURE 5.36
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
POST TEST

SECTION 6
TEST DATA PLOTS

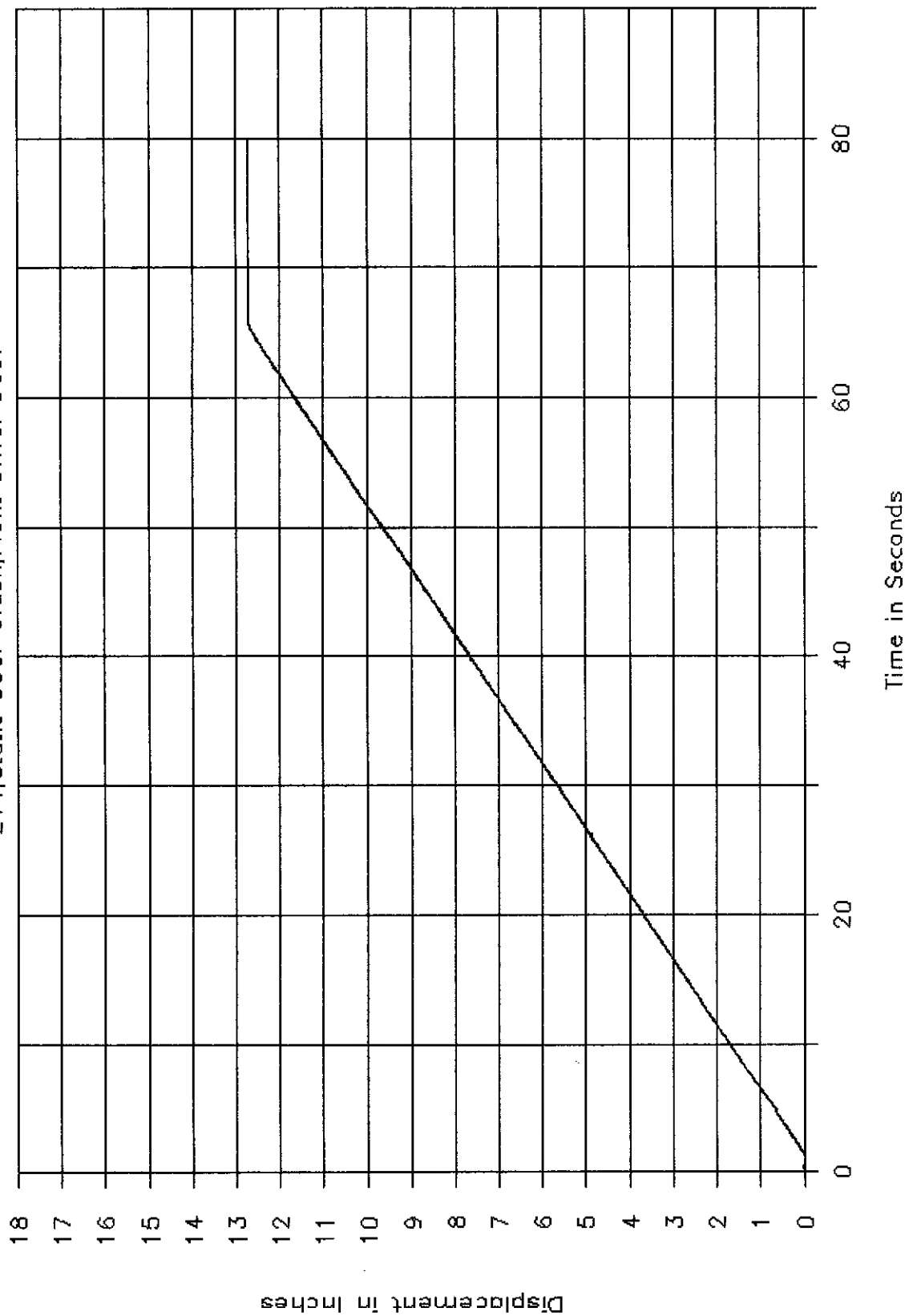
GTL 5242, NHTSA C45207.

214,Static Door Crush,Front Driver Door



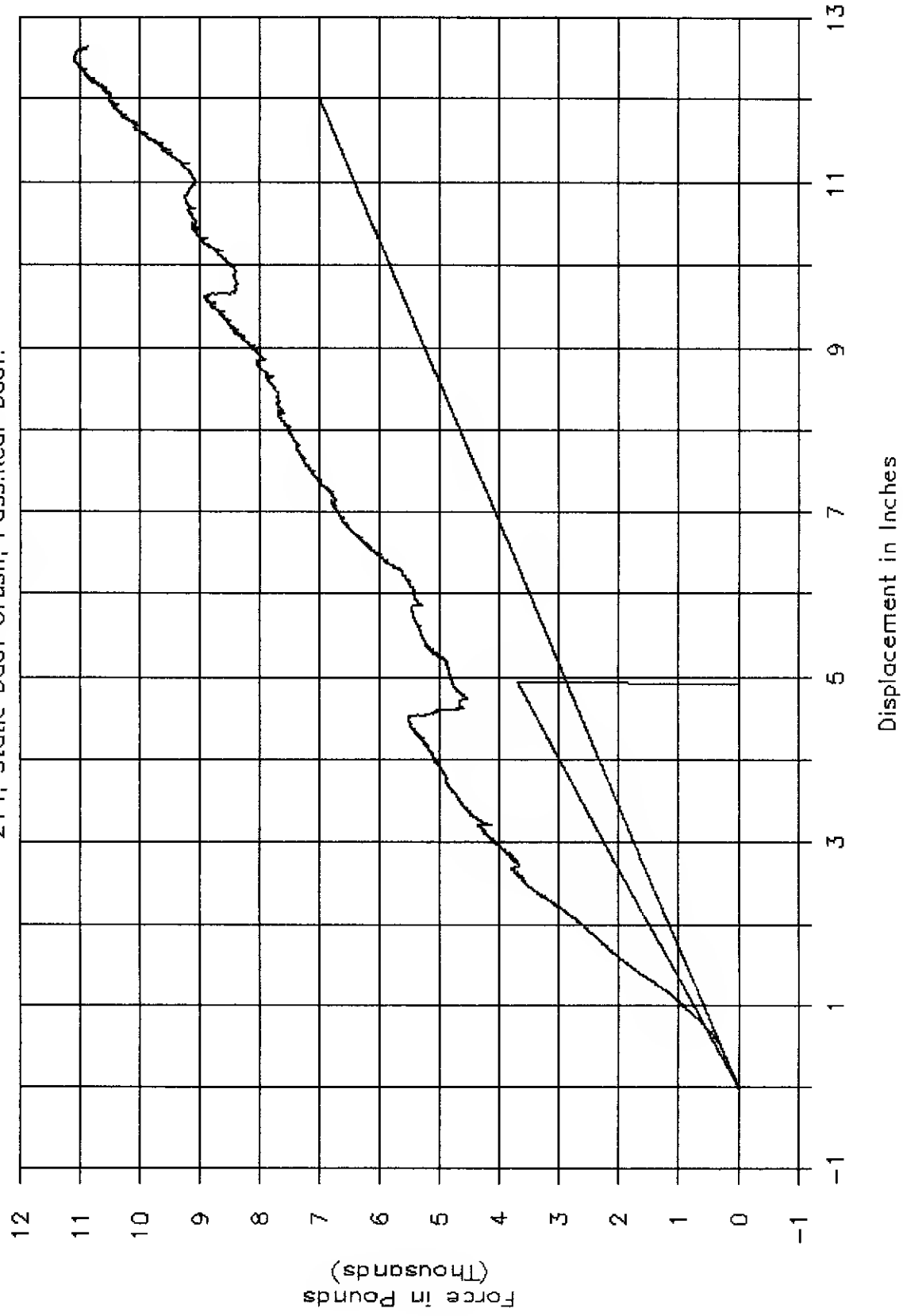
GTL 5242, NHTSA C45207.

214, Static Door Crush, Front Driver Door



GTL 5243, NHTSA C45207.

214, Static Door Crush, Pass.Rear Door.



GTL 5243, NHTSA C45207.

214, Static Door Crush, Pass.Rear Door.

